hp StorageWorks
Edge Switch 2/24

This guide provides procedures for installing, configuring, and managing the HP StorageWorks Edge Switch 2/24.

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About this Guide

This installation guide provides information to help you:

■   Install the Edge Switch 2/24

■   Perform initial configuration of the switch

"About this Guide" topics include:

■   Overview, page 12

■   Conventions, page 12

■   Rack stability, page 16

■   Getting help, page 16

Overview

This section covers the following topics:

- Intended audience
- Related documentation

Intended audience

This book is intended for use by administrators who are experienced with the following:

- Fibre Channel technology
- StorageWorks Fibre Channel switches by HP

Related documentation

For a list of corresponding documentation included with this product, see the Related Documents section of the *HP StorageWorks Edge Switch 2/24 Release Notes*.

For the latest information, documentation, and firmware releases, please visit the HP StorageWorks web site:

http://h18006.www1.hp.com/storage/saninfrastructure.html

For information about Fibre Channel standards, visit the Fibre Channel Industry Association web site, located at http://www.fibrechannel.org.

Conventions

Conventions consist of the following:

- Document conventions
- Text symbols
- Equipment symbols

Document conventions

This document follows the conventions in Table 1.

Table 1: Document conventions

Convention	Element
Blue text: Figure 1	Cross-reference links
Bold	Menu items, buttons, and key, tab, and box names
Italics	Text emphasis and document titles in body text
Monospace font	User input, commands, code, file and directory names, and system responses (output and messages)
Monospace, italic font	Command-line and code variables
Blue underlined sans serif font text (http://www.hp.com)	web browser site addresses

Text symbols

The following symbols may be found in the text of this guide. They have the following meanings:

> **WARNING:** Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.

> **Caution:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

> **Tip:** Text in a tip provides additional help to readers by providing nonessential or optional techniques, procedures, or shortcuts.

> **Note:** Text set off in this manner presents commentary, sidelights, or interesting points of information.

Equipment symbols

The following equipment symbols may be found on hardware for which this guide pertains. They have the following meanings:

Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of personal injury from electrical shock hazards, do not open this enclosure.

Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

WARNING: To reduce the risk of personal injury from a hot component, allow the surface to cool before touching.
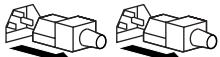
Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

WARNING: To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

Rack stability

Rack stability protects personnel and equipment.

⚠ **WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- In single rack installations, the stabilizing feet are attached to the rack.
- In multiple rack installations, the racks are coupled.
- Only one rack component is extended at any time. A rack may become unstable if more than one rack component is extended for any reason.

Getting help

If you still have a question after reading this guide, contact an HP authorized service provider or access our web site: http://www.hp.com.

HP technical support

Telephone numbers for worldwide technical support are listed on the following HP web site: http://www.hp.com/support. From this web site, select the country of origin.

Note: For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Storage Web site

The HP web site has the latest information on this product, as well as the latest drivers. Access storage at: http://www.hp.com/country/us/eng/prodserv/storage.html. From this web site, select the appropriate product or solution.

HP Authorized Reseller

For the name of your nearest HP authorized reseller:

■ In the United States, call 1-800-345-1518.

■ In Canada, call 1-800-263-5868.

Elsewhere, see the HP web site for locations and telephone numbers: http://www.hp.com.

Switch Features

1

The HP StorageWorks Edge Switch 2/24 provides dynamic switched connections between Fibre Channel servers and devices in a storage area network (SAN) environment. SANs introduce the concept of server-to-device networking and multi-switch fabrics, eliminate requirements for dedicated connections, and enable the enterprise to become data centric.

A SAN provides speed, high capacity, and flexibility for the enterprise, and is primarily based upon Fibre Channel architecture. The switch implements Fibre Channel technology that provides a bandwidth of 2.125 Gbps, redundant switched data paths, a scalable number of active ports, and long transmission distances.

This chapter describes the switch and attached HP StorageWorks HA-Fabric Manager appliance (HAFM). The chapter specifically discusses:

- Edge Switch 2/24 Description, page 20
- Switch Management, page 27
- Operational Features, page 31
- Optional Kits, page 37

Edge Switch 2/24 Description

The Edge Switch 2/24 provides Fibre Channel connectivity through 24 generic mixed ports (GX_Ports). Switch ports can be configured as:

- Fabric ports (F_Ports) to provide direct connectivity for up to 24 switched fabric devices.

- Fabric loop ports (FL_Ports) to provide arbitrated loop connectivity and fabric attachment for FC-AL devices. Each FL_Port can theoretically support the connection of 126 FC-AL devices.

- Expansion ports (E_Ports) to provide interswitch link (ISL) connectivity to fabric directors and switches.

The switch, shown in Figure 1 on page 21, provides dynamic switched connections for servers and devices, supports mainframe and open-systems interconnection (OSI) computing environments, and provides data transmission and flow control between device node ports (N_Ports) as dictated by the Fibre Channel Physical and Signaling Interface (FC-PH 4.3). Through interswitch links (ISLs), the switch can connect additional switches to form a Fibre Channel multi-switch fabric.

The switch provides connectivity for devices manufactured by multiple original equipment manufacturers (OEMs). To determine if an OEM product can communicate through connections provided by the switch, or if communication restrictions apply, refer to the supporting publications for the product or contact your HP marketing representative.
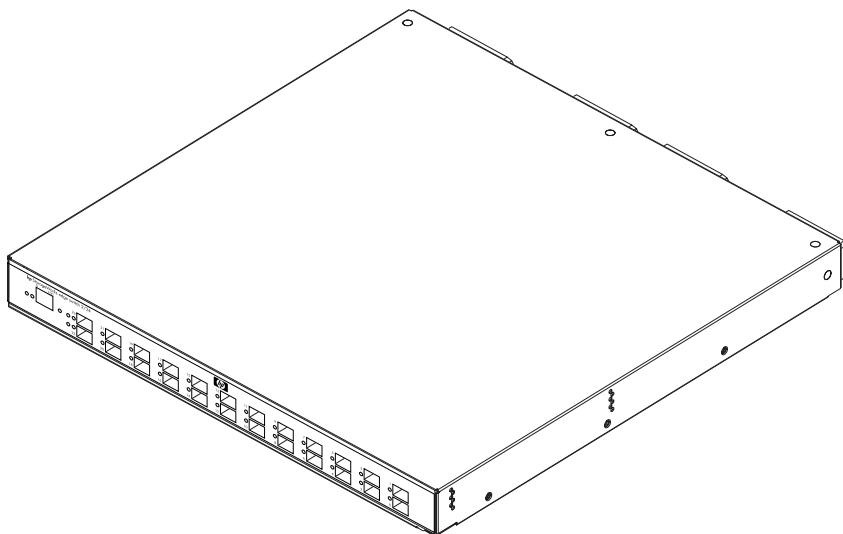
Figure 1: Edge Switch 2/24 (front view)

Field Replaceable Units (FRUs)

The switch provides a modular design that enables quick removal and replacement of FRUs, including small form factor pluggable (SFP) optical transceivers and power supply assemblies with internal cooling fans. Edge Switch 2/24 FRUs are detailed in the front and rear panel feature descriptions.

Front Panel Features

Connectors and indicators include the:

■ Combined initial machine load and reset (IML/RESET) button.

■ Ethernet LAN connector.

■ Green power (PWR) and amber system error (ERR) LEDs.

■ Green, blue, and amber status LEDs associated with FRUs.

Figure 2 shows the front panel controls, connectors and indicators.
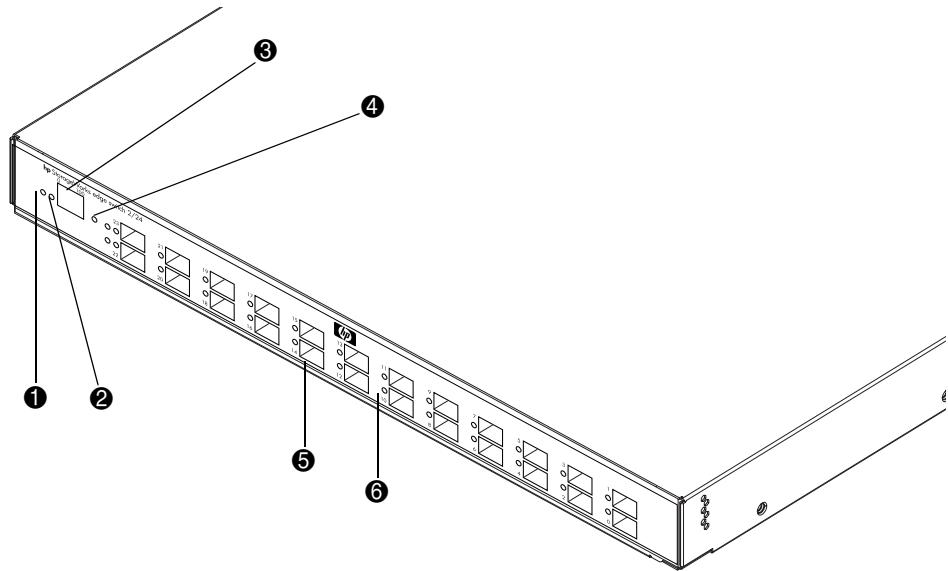
❶ Power LED (green)   ❹ Initial machine load (IML) button
❷ Error LED (amber   ❺ SFP fiber optic connectors
❸ Ethernet LAN connector   ❻ Port LEDs

Figure 2: Edge Switch 2/24 front panel features

Power and System Error LEDs

The Power LED, as shown in Figure 2, illuminates when the switch is connected to facility AC power and powered on. If the LED extinguishes, a facility power source, power cord, or power distribution failure is indicated.

The Error LED, as shown in Figure 2, illuminates when the switch detects an event requiring immediate operator attention, such as a FRU failure. The LED remains illuminated as long as an event is active. The LED extinguishes when the Clear System Error Light function is selected from the Product Manager application.

The LED blinks if unit beaconing is enabled. An illuminated LED (indicating a failure) takes precedence over unit beaconing. The LED also blinks (at twice the beaconing rate) when the IML/RESET button is pressed and held for more than three seconds.

Ethernet LAN Connector

The front panel provides a 10/100 megabit per second (Mbps) RJ-45 twisted-pair connector that attaches to an Ethernet LAN to provide communication with the HAFM appliance or an SNMP management workstation. Two green LEDs are associated with the LAN connector. When illuminated, the left LED indicates LAN operation at 10 Mbps, and the right LED indicates LAN operation at 100 Mbps.

Initial Machine Load Button

The IML/RESET button is shown in Figure 2 on page 22. When the IML/RESET button is pressed, held for three seconds, and released, the switch performs an initial machine load that reloads the firmware from FLASH memory. This operation is not disruptive to Fibre Channel traffic. If the button is held for more than three seconds, the ERR LED blinks at twice the unit beaconing rate.

When the IML/RESET button is pressed and held for ten seconds, the switch performs a reset. After three seconds, the ERR LED blinks at twice the unit beaconing rate. A reset is disruptive and resets the:

■ Microprocessor and functional logic for the CTP card and reloads the firmware from FLASH memory.

■ Ethernet LAN interface, causing the connection to the HAFM appliance to drop momentarily until the connection automatically recovers.

■ Ports, causing all Fibre Channel connections to drop momentarily until the connections automatically recover. This causes attached devices to log out and log back in; therefore data frames lost during switch reset must be retransmitted.

A reset should only be performed if a CTP card failure is indicated. As a precaution, the IML/RESET button is flush mounted to protect against inadvertent activation.

SFP Transceivers (Fibre Channel Ports)

The Edge Switch 2/24 provides 24 Fibre Channel ports. A single-mode or multi-mode fiber optic cable attaches to a port through a small form factor pluggable (SFP) transceiver. The SFP provides a duplex LC interface, and can be detached from the switch port for easy replacement.

The following fiber optic transceiver types are available:

■ **Shortwave laser**–Shortwave laser SFPs provide short-distance connections (2 to 500 meters) through 50-micron or 62.5-micron multi-mode fiber.

■ **Longwave laser**–Longwave laser SFPs provide long-distance connections (up to 10 kilometers) through 9-micron single-mode fiber.

■ **Extended longwave laser**–Two types of extended longwave laser transceivers provide connections for transferring 2.125 Gbps data up to 20 kilometers or 35 kilometers through 9-micron single-mode fiber.

Port LEDs

Amber and green/blue LEDs to the left of each Fibre Channel port illuminate, extinguish, or blink to indicate port status and port speed.

■ Amber LED–illuminates if the port fails.

■ Green/blue LED–illuminates green to indicate 1.0625 Gbps port operation. Illuminates blue to indicate 2.125 Gbps port operation.

Rear Panel Features

The switch provides a modular design that enables quick removal and replacement of field-replaceable power supply assemblies with internal cooling fans. Figure 3 illustrates the rear of the switch.

| ❶ | Power supplies with internal cooling fans (2) | ❷ | Maintenance port |
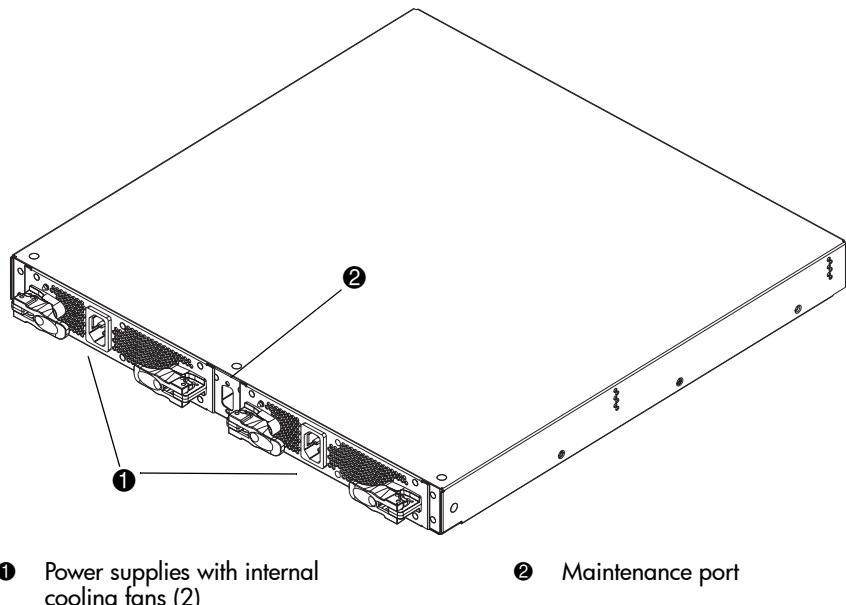
Figure 3: Edge Switch 2/24 (rear view)

Power Supplies

The switch contains two power supply assemblies with internal cooling fans. The redundant, load-sharing power supply assemblies step down and rectify facility input power to provide 3.3 volts direct current (VDC), 5 VDC, and 12 VDC to the control processor (CTP) card. The power supplies also provide input filtering, overvoltage protection, and overcurrent protection. An amber LED on each assembly illuminates if the FRU fails.

Either power supply can be replaced while the switch is operational. Each power supply has a separate connection to the CTP card to allow for independent AC power sources. The power supplies are input rated at 90 to 264 volts alternating current (VAC).

Three cooling fans integrated in each power supply assembly (six fans total) provide cooling for the power supplies and CTP card, as well as redundancy for continued operation if a single fan fails. Fans are removed and replaced as part of the integrated power supply.

Power supply requirements are listed in "Technical Specifications" on page 133.

Maintenance Port

The rear panel provides a 9-pin DSUB maintenance port, as shown in Figure 3 on page 25, that provides a connection for a local terminal or dial in connection for a remote terminal. Although the port is typically used by authorized maintenance personnel, operations personnel can use the port to configure switch network addresses.

Switch Management

The switch is managed and controlled through a:

■ Customer-supplied PC platform with an Internet connection to the Embedded Web Server (EWS) interface on the switch. Using this graphical user interface (GUI), operators can quickly view switch status. The interface also allows service personnel to perform configuration tasks, view system alerts and related log information, and monitor switch status, port status, and performance. FRU status and system alert information are highly visible.

■ Optional High Availability Fabric Manager (HAFM) appliance with the Java-based Edge Switch 2/24 HAFM Element Manager installed. The HAFM appliance provides a central point of control for up to 48 edge switches or directors.

■ Customer-supplied remote workstation communicating with the HAFM appliance through a corporate intranet.

Embedded Web Server (EWS)

Administrators or operators with a browser-capable PC and a LAN to which the switch is connected can monitor and manage the switch through the Embedded Web Server (EWS) interface. The EWS interface manages only a single switch, and provides a graphical user interface (GUI) that supports product configuration, statistics monitoring, and basic operation. The EWS interface is opened from a standard web browser running Netscape Navigator 4.6 or later or Microsoft Internet Explorer 4.0 or later.

At the browser, enter the Internet Protocol (IP) address of the switch as the Internet uniform resource locator (URL). When prompted at a login screen, enter a user name and password.

Refer to the *HP StorageWorks Embedded Web Server User Guide* for more information.

High Availability-Fabric Manager and Element Manager

As an option, the switch can be managed through an High Availability-Fabric Manager (HAFM) appliance running the Edge Switch 2/24 Product Manager application. Multiple switches and the HAFM appliance communicate on a local area network (LAN) through one or more 10/100 Base-T Ethernet hubs. One or more 24-port Ethernet hubs are optional and can be ordered with the switch. Up to three hubs are daisy-chained as required to provide additional Ethernet connections as more switches (or other HP managed products) are installed on a customer network.

The HAFM appliance provides a central point of control for up to 48 LAN-connected Directors or Edge Switches.

The server is mounted in a slide-out drawer in the HP-supplied equipment rack. The HAFM appliance or Ethernet access to the Embedded Web Server (EWS) interface is required to install, configure, and manage the Edge Switch 2/24.

Although a configured switch operates normally without HAFM appliance intervention, an attached server should operate at all times to monitor switch operation, log events and configuration changes, and report failures.

The HAFM appliance provides an auto-detecting 10/100 Mbps LAN connection to the customer's public intranet to allow access from remote user workstations.

Remote Workstations

Using a standard web browser, the HAFM and client applications can be downloaded and installed on remote user workstations that are LAN-attached to the HAFM appliance. Operators at these workstations can manage and monitor switches controlled by the HAFM appliance. A maximum of nine concurrent users (eight remote users and one local user) can log in to the HAFM application running on the HAFM appliance. Each remote workstation must have access to the LAN segment on which the HAFM appliance is installed. Switch administrative functions are accessed through the LAN and HAFM appliance.

LAN Interface Options

The LAN interface can be:

■ Part of the dedicated 10/100 Mbps segment that provides access to managed switches. This switch-to-HAFM appliance connection is part of the required equipment installation. Connection of remote workstations can be through an Ethernet hub or through the customer intranet.

If only one HAFM appliance connection is used and this connection is provided through the customer intranet, functions provided by the HAFM appliance are available to all users.

Dual LAN connections provide a dedicated LAN segment that isolates the HAFM appliance and managed switches from unauthorized users.

■ Part of a second HAFM appliance interface that connects to a customer intranet and allows operation of the HAFM application from remote user PCs or workstations. Connection to this LAN segment is optional and depends on customer requirements.

Minimum Remote Workstation Requirements

Client HAFM applications download and install to remote workstations (from the HAFM appliance) using a standard web browser. The applications operate on platforms that meet the following minimum system requirements:

■ Desktop or notebook PC with color monitor, keyboard, and mouse, using an Intel III processor with a 700 MHz or greater clock speed, and using the Microsoft Windows 2000 (with Service Pack 4), Windows XP, Windows NT 4.0 (with Service Pack 6a), or Windows Server 2003.

■ Unix workstation with color monitor, keyboard, and mouse, using a:

— Linux-based system using an Intel Pentium III processor with 1 GHZ or greater clock speed, using Red Hat 7.3 or later operating system.

— Hewlett-Packard HA PA-RISC processor with a 400 MHz or greater clock speed, using the HP-UX 11 or later operating system.

— Sun Microsystems UltraSPARC™ II processor with a 400 MHz or greater clock speed, using the SunOS™ Version 7 or later operating system.

— IBM Power3-II microprocessor with a 333 MHz or greater clock speed, using the AIX Version 4.3.3 or later operating system.

■ At least 150 MB for Windows-based system or 350 MB for Unix-based systems available on the internal hard drive.

■ 512MB or greater RAM.

■ Video card supporting 256 colors at 800 x 600 pixel resolution.

■ Ethernet network adapter.

■ Java-enabled Internet browser, such as Microsoft Internet Explorer (Version 4.0 or later) or Netscape Navigator (Version 4.6 or later).

Refer to the HAFM appliance installation guide and the *HP StorageWorks High Availability-Fabric Manager User Guide* for more information.

Command Line Interface

The command line interface (CLI) allows you to access many HAFM functions while entering commands during a Telnet session with the switch.The primary purpose of the CLI is to automate management of a large number of switches using scripts. The CLI is not an interactive interface; no checking is done for pre-existing conditions and no prompts display to guide users through tasks.

Refer to *HP StorageWorks CLI Reference Guide for Directors and Edge Switches* for more information.

Operational Features

The Edge Switch 2/24 supports several operational features including:

■ Advanced error detection, reporting, and serviceability.

■ Support for multi-switch fabrics.

■ Software diagnostics to aid in fault isolation and repair.

Error-Detection, Reporting, and Serviceability Features

The switch provides the following error detection, reporting, and serviceability features:

■ Light-emitting diodes (LEDs) on switch FRUs and adjacent to Fibre Channel ports that provide visual indicators of hardware status or malfunctions.

■ FRUs (SFP transceivers and integrated cooling fan and power supply assemblies) that are removed or replaced without disrupting switch or Fibre Channel link operation.

■ A modular design that enables quick removal and replacement of FRUs without the use of tools or equipment.

■ System alerts and logs that display switch, Ethernet link, and Fibre Channel link status at the EWS interface, HAFM appliance, or remote workstation.

■ Diagnostic software that performs power-on self-tests (POSTs) and port diagnostics (loopback tests).

■ An RS-232 maintenance port at the rear of the switch (port access is password-protected) that enables installation or service personnel to change the switch's IP address, subnet mask, and gateway address.

These parameters can also be changed through a Telnet session, access for which is provided through a local or remote PC with an Internet connection to the switch.

■ Data collection through the EWS interface or Element Manager of the HAFM applications to help isolate system problems. The data includes a memory dump file and audit, hardware, and engineering logs.

■ Beaconing to assist service personnel in locating a specific port or switch. When port beaconing is enabled, the amber LED associated with the port flashes. When unit beaconing is enabled, the system error indicator on the front panel flashes. Beaconing does not affect port or switch operation.

- Automatic notification of significant system events (to support personnel or administrators) through e-mail messages or the call-home feature.

- SNMP management using the Fibre Channel Fabric Element MIB (v3.1), TCP/IP MIB-II definition (RFC 1213), or a product-specific MIB that runs on the switch. Up to six authorized management workstations can be configured through the EWS interface and Element Manager to receive unsolicited SNMP trap messages. The trap messages indicate product operational state changes and failure conditions.

- Optional SNMP management using the Fibre Alliance MIB that runs on the HAFM appliance. Up to 12 authorized management workstations can be configured through the HAFM server to receive unsolicited SNMP trap messages. The trap messages indicate operational state changes and failure conditions.

Note: For more information about SNMP support provided by Hewlett-Packard products, refer to the *HP StorageWorks SNMP Reference Guide for Directors and Edge Switches*.

Management Appliance

The HAFM appliance and Element Manager provide a GUI to manage, monitor, and isolate problems for multiple switches and multiswitch fabrics. The server and client applications operate on the management appliance, and a user interface is provided through an Ethernet LAN-attached PC or workstation running client-only applications as shown in Figure 4:
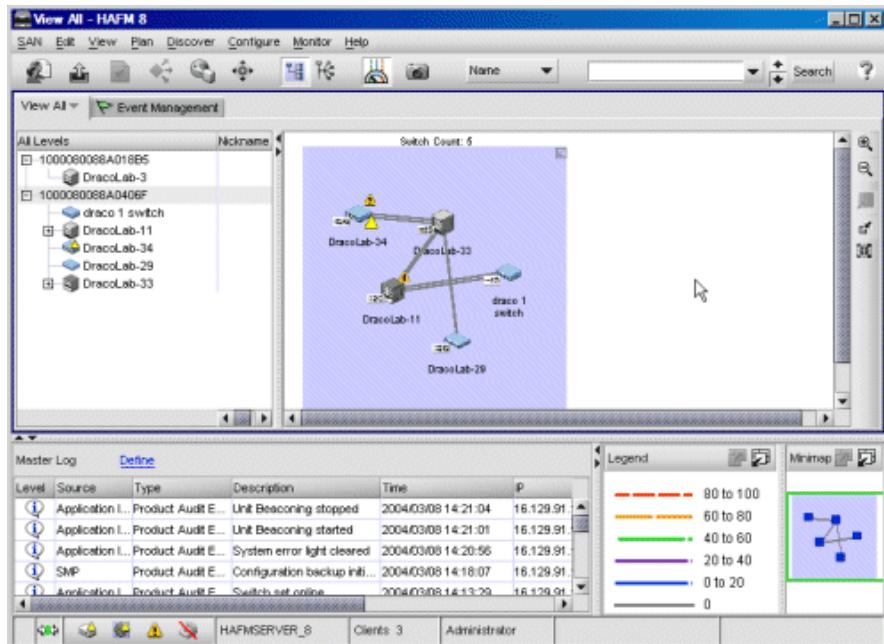
Figure 4: Management appliance main window

The main window provides:

- **Menu bar**–Commands at the top of the window provide drop-down menu selections to perform functions for SAN devices including editing, viewing, planning, discovery, configuration, and monitoring.

- **Tool bar**–The tool bar (below the menu bar) provides button selections to perform SAN management tasks including opening a SAN configuration, configuring users, setting up and starting the device discovery process, configuring zoning, displaying a SAN, displaying SAN utilization, and viewing reports.

- **View tab**–Select the View tab to display a product list and physical map of the discovered topology.

- **Product list**–When the View tab is selected, the product list at the left side of the window displays a list of discovered devices and associated properties.

- **Physical map**–When the View tab is selected, the physical map at the right side of the window depicts the SAN topology, discovered devices, and color-coded links.

- **Tool box**–The toolbox at the right side of the window provides button selections to change the discovered topology display, including zoom in, zoom out, expand, and collapse functions.

- **Master log**–The master log at the lower left corner of the window displays a list of informational, warning, or fatal events. The log also includes the event source, type, description, time, and IP address of the device generating the event.

- **Utilization legend**–The color-coded utilization legend explains percent utilization for links depicted on the physical map.

- **Minimap**–The minimap at the lower right corner of the window displays the entire SAN topology, and provides an aid to navigate the more detailed physical map.

- **Status bar**–The status bar at the bottom of the window displays connection status, client information, user level, and discovery status.

Zoning

The switch supports a name server zoning feature that partitions attached devices into restricted-access groups called zones. Devices in the same zone can recognize and communicate with each other through switched port-to-port connections. Devices in separate zones cannot communicate with each other.

Zoning is configured by authorizing or restricting access to name server information associated with device N_Ports that attach to switch fabric ports (F_Ports). A zone member is specified by the port number to which a device is attached, or by the 8-byte (16-digit) World Wide Name (WWN) assigned to the host bus adapter (HBA) or Fibre Channel interface installed in a device. A device can belong to multiple zones.

Note: By default, zoning is disabled. You must enable zoning to see devices.

> ⚠ **Caution:** If zoning is implemented by port number, a change to the switch fiber optic cable configuration disrupts zone operation and may incorrectly include or exclude a device from a zone.
>
> If zoning is implemented by WWN, removal and replacement of a device HBA or Fibre Channel interface (thereby changing the device WWN) disrupts zone operation and may incorrectly include or exclude a device from a zone.
>
> In Open Fabric mode, only zoning by WWN is supported. Zoning by port numbers is not.

Zones are grouped into zone sets. A zone set is a group of zones that is enabled (activated) or disabled across all switches in a multi-switch fabric. Only one zone set can be enabled at one time.

Multi-Switch Fabrics

A Fibre Channel topology that consists of one or more interconnected switches or switch elements is called a fabric. Operational software provides the ability to interconnect switches (through expansion port (E_Port) connections) to form a multi-switch fabric. The data transmission path through the fabric is typically determined by fabric elements and is user-transparent. Subject to zoning restrictions, devices attached to any interconnected switch can communicate with each other through the fabric.

Software Diagnostics

The switch provides the following diagnostic software features that aid in fault isolation and repair of problems:

■   FRUs provide on-board diagnostic and monitoring circuits that continuously report FRU status to the Embedded Web Server (EWS), and HAFM applications. These applications provide system alerts and logs that display failure and diagnostic information at the HAFM appliance or a remote workstation communicating with the HAFM appliance.

■   The HAFM Services application that runs as a Windows service and provides an additional user interface to display operational status.

■   The EWS interface that provides Ethernet access to isolate problems for a single switch.

■   Unsolicited SNMP trap messages that indicate operational state changes or failures can be transmitted to up to 12 authorized management workstations on an HAFM appliance, and up to 6 authorized management workstations on an Edge switch or director.

■   E-mail messages or call-home reports that provide automatic notification of significant system events to designated support personnel or administrators.

Optional Kits

Contact your Hewlett-Packard authorized service provider to purchase the following optional Edge Switch 2/24 kits described in Table 2.

Table 2: Edge Switch 2/24 Optional Kits

Supporting Kit	Description
8-flexport upgrade for Edge Switch 2/24 Part Number: 316096-B21	Used to upgrade the Edge Switch 2/24 from: ■ 8 to 16 ports ■ 16 to 24 ports.
Edge Switch 2/24 Product Manager License Part Number: 317067-B21	Used when switch is managed through HAFM.
HP Open Trunking License Part Number: 336002-B21	Provides a license to use the Open Trunking feature.
HP SANtegrity Binding License Part Number: 317073-B21	Provides a license to use the SANtegrity Binding feature.
2Gb UPM Port Module Kit Part Number: 316094-B21	Provides 4 additional short-wave ports for the Edge Switch 2/24.
300m Optical Transceiver Kit Part Number: 300834-B21	Provides short-wave optical transceiver for the Edge Switch 2/24.
10km Long Distance Optical Transceiver Kit Part Number: 300835-B21	Provides 10 km long-wave optical transceiver for the Edge Switch 2/24.
35 km Extended Reach Optical Transceiver Kit Part Number: 300836-B21	Provides 35 km long-wave optical transceiver for the Edge Switch 2/24.

Rack Mount Instructions

2

This chapter describes how to rack mount the HP StorageWorks Edge Switch 2/24 in the appropriate HP, or comparable, 19-inch Electronic Industries Association (EIA) rack:

■ HP 9000 series, 10000 series, and 11000 series racks

■ HP rack system/e or 19-inch EIA rack

This chapter includes:

■ Rack Mount Checklist, page 40

■ Mounting the Adjustable Brackets in the Rack, page 42

■ Mounting the Slide Rails on the Sides of the Switch, page 43

■ Installing the Switch in the Cabinet, page 45

Rack Mount Checklist

This section describes the contents of the rack mount kit as well as tools or equipment required to complete the installation.

Note: The hardware kit includes parts not required for the configuration described in these instructions.

Mounting Hardware

- Two (2) two-hole bar nuts
- Six (6) three-hole bar nuts (only 4 used)
- Eight (8) square alignment washers (required only for HP 9000, 10000 and 11000 series racks)
- Eight (8) Phillips panhead screws (10-32 x 1/2) with split lock and flat washers
- Four (4) Phillips flathead screws (8-32 x 7/16)
- Ten (10) Phillips panhead screws (10-32 x 5/8) with flat washer (only 2 used)
- Six (6) Phillips flathead screws (6-32 x 3/8) (not used)
- Twelve (12) Phillips panhead screws (10-32 x 3/8) (not used)
- Four (4) 8-32 Keps nuts (not used)

Brackets and Rails

Brackets and rails included in the kit are shown in Figure 5.

❶ Two (2) fixed-length slide rails (one left and one right)

❷ Two (2) Front brackets

❸ Two (2) Rear brackets (long)

❹ Two (2) Rear spacing bracket

❺ Rear bracket (short)–not used in this configuration
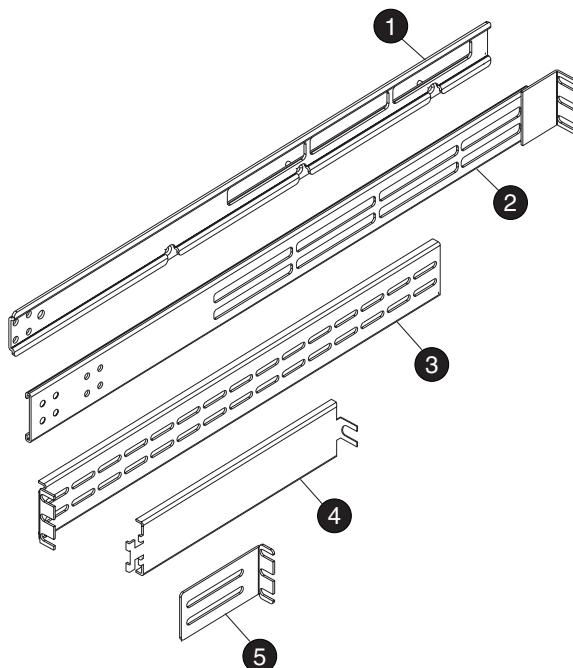
Figure 5: Brackets included in kit

Required Tools

The following tools are required, but are not included in the kit:

■ Torque driver with a T10 Torx bit

■ #2 Phillips screwdriver

Mounting the Adjustable Brackets in the Rack

Use these steps to install the adjustable brackets on the rack. You will need a #2 Phillips screwdriver and eight 10x32 panhead screws to complete this procedure.

Note: If you are installing the Edge Switch 2/24 in an HP 9000, 10000 or 11000 series rack, you will need eight square alignment washers to complete this procedure.

1. Determine the position of the switch in the rack. Each Edge Switch 2/24 is 1.75 inches or 1U high.
2. Attach four bar nuts (three-hole bar nuts) to the cabinet frame using eight (8) Phillips panhead screws (10-32 x 1/2) with split lock and flat washers.

Note: Do not install a screw in the center hole of each bar nut.

   a. If you are installing the Edge Switch 2/24 in an HP 9000, 10000, or 11000 series rack, place a square alignment washer on each panhead screw before inserting in the square cabinet frame holes.
   b. Mount the bar nut on the inside of the cabinet frame. Orient the holes in the bar nut so that they are aligned closest to the inside edge of the cabinet frame.
   c. Secure, but do not completely tighten, all screws.
3. Measure cabinet depth from inside edge to inside edge of the cabinet frame.
4. Assemble two sets of front and rear brackets so that the combined brackets are equal to the depth of the cabinet.
5. Attach a two-hole bar nut using four (4) Phillips flathead screws (8-32 x 7/16) to hold each assembled bracket together. Do not completely tighten but tighten enough to hold the brackets together.
6. Install the assembled brackets in the cabinet by sliding the mounting brackets between the bar nut and cabinet frame.
7. Tighten the three-hole bar nut screws on the mounting brackets to where the rails are stable, but can be easily adjusted.
8. Securely tighten the two-hole bar nut screws holding the front and rear brackets together.

Mounting the Slide Rails on the Sides of the Switch

Use these steps to install the slide rails on the sides of the switch as shown in Figure 6. You will need a torque driver with a T10 Torx bit (not supplied in the kit) and left and right slide rails to complete this procedure.

Note: You may want to remove the Edge Switch 2/24 power supplies, as this will make the device lighter and easier to handle.

⚠️ **WARNING:** Before removing the power supplies, review the *HP StorageWorks Edge Switch 2/24 Service Guide* for details on removing power supplies.

1. On the Edge Switch 2/24, remove the six screws (three screws per side) that help hold the switch cover in place.

Note: Do not discard these screws, as you will use them to attach the slide rails.

2. Using the torque driver and the screws you removed earlier, attach the left and right slide rails to the Edge Switch 2/24.
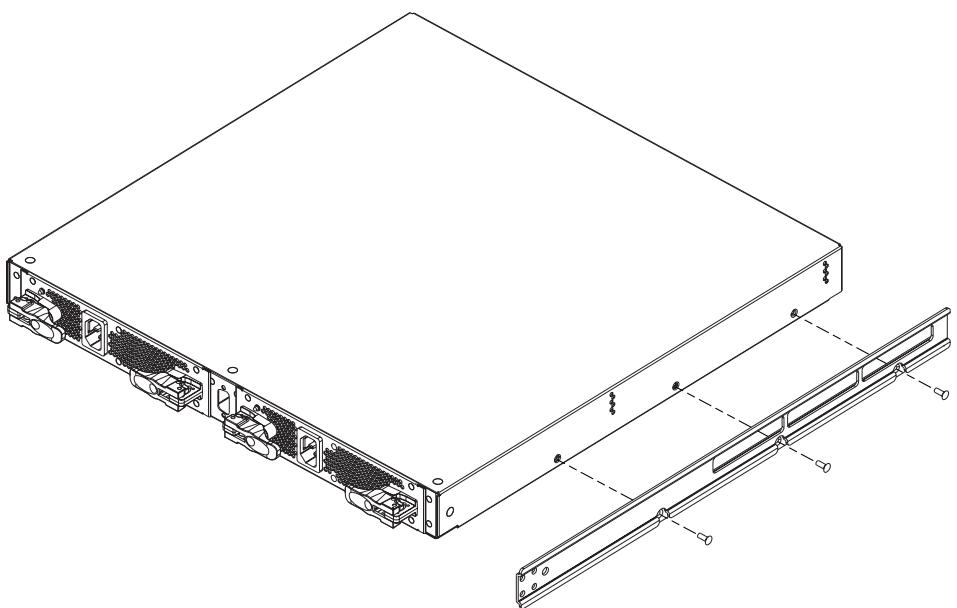
Figure 6: Attaching the slide rail to the switch

Installing the Switch in the Cabinet

Use these steps to install the switch in the cabinet. You will need a #2 Phillips screwdriver and two rear spacing brackets to complete this procedure.

1. From the front side of the cabinet, slide the switch into the mounting brackets and along the rails until the rear of the switch is flush with the rear of the cabinet.

2. Bring the rear spacing brackets to the rear of the cabinet.

3. Pull the switch toward the rear of the cabinet until it protrudes approximately 3 inches.

4. Orient the rear spacing bracket mounts so that they are pointed outward. Insert the tabs on each rear spacing bracket into the designated slots in each rail.

5. Push the switch forward using both rear spacing brackets until the rear spacing bracket mounts contact the cabinet rail.

6. Attach the rear spacing brackets to the cabinet using two Phillips panhead screws (10-32 x 5/8) with flat washer.

7. Ensuring that the square alignment washers are seated properly within the square cabinet frame holes, use a Phillips head screwdriver to tighten the rear and front mounting screws.

Installing and Configuring the Edge Switch 2/24

3

This chapter describes tasks to install, configure, and verify operation of the Edge Switch 2/24. This chapter includes the following topics:

Installation Options

The Edge Switch is installed in one of two configurations. The options are:

- **Table or desktop—**one or more Edge Switches, an optional HAFM appliance, and an optional Ethernet hub are installed at the customer facility on a desk or table top. Ethernet cabling distance, and local area network (LAN) addressing issues must be considered.

- **Customer-supplied equipment rack—**one or more Edge Switches, an optional HAFM appliance, and an optional Ethernet hub are installed in a customer-supplied equipment rack. Rack-mount hardware is provided in the shipping container. Ethernet cabling, distance, and LAN addressing issues must be considered.

Review Installation Requirements

Verify that the following requirements are met prior to Edge Switch and HAFM appliance installation. Ensure:

■ A site plan is prepared, configuration planning tasks are complete, planning considerations are evaluated, and related planning checklists are complete. Fabric and device connectivity are evaluated, and the related planning worksheet is complete. Refer to the *HP StorageWorks HA-Fabric Manager User Guide*.

■ Support is available for one of the following Edge Switch management methods:

— A browser-capable PC or Linux system and Ethernet connectivity to support Edge Switch management through the Embedded Web Server (EWS) interface

— The HAFM appliance and LAN segment connectivity to support Edge Switch management through the HAFM and Element Manager.

■ Support equipment and personnel are available for the installation.

■ The required number and type of fiber optic jumper cables are delivered and available.

■ Ensure that the cables are the correct length with the required connectors.

■ A customer-supplied equipment rack and associated hardware are available (optional).

■ Remote workstations or simple network management protocol (SNMP) workstations are available (optional). Workstations are customer-supplied and connected through a corporate or dedicated LAN.

Unpack and Inspect the Switch

This section provides instructions for unpacking and inspecting the Edge Switch 2/24 prior to installing it in a desktop or rack-mount configuration.

To unpack and inspect the switch:

> **Caution:** When you remove the Edge Switch from the carton, do not rest it on its rear window while examining it. To do so may break the FRU handles.

1. Inspect the shipping containers for damage caused during transit. If a container is damaged, ensure that a representative from the freight carrier is present when the container is opened.

2. Unpack the shipping containers and inspect each item for damage. Save all shipping and packing materials. Ensure that all items on the enclosed shipping list are in each container.

3. If any items are damaged or missing, customers should contact an HP-authorized service provider or reseller.

Install the Edge Switch on a Desktop

To install and configure the Edge Switch on a desktop:

1. Remove the backing from the four adhesive rubber pads and apply the pads to the underside of the Edge Switch.

2. Ensure that the pads are aligned with the scribed circles at each corner.

3. Position the Edge Switch on a table or desktop as directed by the customer. Ensure that:

   ■ Grounded AC electrical outlets are available.

   ■ Adequate ventilation is present.

   ■ Areas with excessive heat, dust, or moisture are avoided.

   ■ All planning considerations are met. Refer to the *HP StorageWorks HA-Fabric Manager User Guide.*

4. Verify all field-replaceable units (FRUs), including small form factor pluggable (SFP) optical transceivers and combined cooling fan and power supply assemblies, are installed as ordered.

5. Connect the U.S. or country-specific (optional) AC power cords to the right (**PS0**) and left (**PS1**) receptacles at the rear of the chassis.

⚠ **WARNING:** An HP-supplied power cord is provided for each Edge Switch power supply. To prevent electric shock when connecting the Edge Switch to primary facility power, use only the supplied power cords, and ensure that the facility power receptacle is the correct type, supplies the required voltage, and is properly grounded.

6. Connect the remaining ends of the AC power cords to separate facility power sources that provide single-phase, 90 to 264 volt alternating current (VAC) current. This provides power redundancy.

   When the first power cord is connected, the Edge Switch powers on and performs power-on self-tests (POSTs). During POSTs:

   a. The green power (**PWR**) LED on the front panel illuminates.

   b. The amber system error (**ERR**) LED on the front panel blinks momentarily while the Edge Switch is tested.

   c. The green LEDs associated with the Ethernet port blink momentarily while the port is tested.

d.   The green/blue and amber LEDs associated with Fibre Channel ports blink momentarily while the ports are tested.

7.   After successful POST completion, the green power (**PWR**) LED remains ON and all other front panel LEDs turn OFF.

8.   If a POST error or other malfunction occurs, refer to the *HP StorageWorks Edge Switch 2/24 Service Manual* to isolate the problem.

9.   Perform the following steps:

■   If you manage the switch through EWS, go to "Using the Embedded Web Server" on page 95 to configure the switch.

■   If you manage the switch through HAFM, go to "Configure Switch Network Information" on page 53.

Configure Switch Network Information

The Edge Switch 2/24 is delivered with the following default network addresses:

- **MAC address** —the media access control (MAC) address is programmed into FLASH memory on the CTP card at the time of manufacture. The MAC address is unique for each Edge Switch, and should not be changed. The address is in `xx.xx.xx.xx.xx.xx` format. The `xxx` is a hexadecimal pair.

- **IP address** —the factory preset default Internet Protocol (IP) address is **10.1.1.10.** The default IP address is also **10.1.1.10**.

  If **Reset Configuration** is selected from the Element Manager application, the Edge Switch resets to the default address of **10.1.1.10**.

  If multiple Edge Switches are installed on the same LAN, each Edge Switch (and the HAFM appliance) must have a unique IP address. One Edge Switch can use the factory-set address, but the addresses of the remaining Edge Switches must be changed.

- **Subnet mask** —the default subnet mask is **255.0.0.0**. If the switch is installed on a complex public LAN with one or more routers, the address may require change.

- **Gateway address** —the default gateway address is **0.0.0.0**. If the switch is installed on a dedicated LAN with no connection through a router, the address does not require change. If the switch is installed on a public LAN (corporate intranet), the gateway address must be changed to the address of the corporate intranet's local router.

Verify that the type of LAN installation with the customer's network administrator. If one switch is installed on a dedicated LAN, network addresses do not require change.

Changing the Switch Address

If multiple switches are installed or a public LAN segment is used, network addresses must be changed to conform to the customer's LAN addressing scheme. The following items are required to perform this task.

- A local workstation (desktop or notebook computer) with:
  - Microsoft Windows Server 2003, Windows 2000, Windows XP, Windows 98, or Windows NT 4.0 operating system.

— RS-232 serial communication software (for example, ProComm Plus or HyperTerminal).

Note that the HAFM appliance may be used for this function and that HyperTerminal is included in the Windows operating system provided in the HAFM appliance.

■ An asynchronous RS-232 null modem cable (provided with the switch).

Perform the following steps to change a switch's IP address, subnet mask, or gateway address:

1. Remove the protective plastic cover from the 9-pin maintenance port at the rear of the switch (a phillips-tip screwdriver is required). Connect the 9-pin end of the RS-232 null modem cable to the port.

2. Connect the other cable end to a 9-pin communication port (**COM1** or **COM2**) at the rear of the maintenance terminal PC.

3. Power on the maintenance terminal. After the PC powers on, the Windows desktop displays. Refer to operating instructions shipped with the PC.

Note: Procedures for changing network addresses using the HyperTerminal serial communication software are described in step 4 through step 13.

---

4. Choose **Start** > **Programs** > **Accessories** > **Communications** > **HyperTerminal**. The Connection Description dialog box displays, (Figure 7).

Figure 7: Connection Description dialog box

5. Enter edge switch 2-24 in the **Name** field and click **OK**. The Connect To dialog box displays (Figure 8).

Figure 8: Connect To dialog box

6. Ensure that the **Connect using** field displays **COM1** or **COM2** (depending on the serial communication port connection to the switch), and click **OK**. The Port Settings dialog box displays (Figure 9).
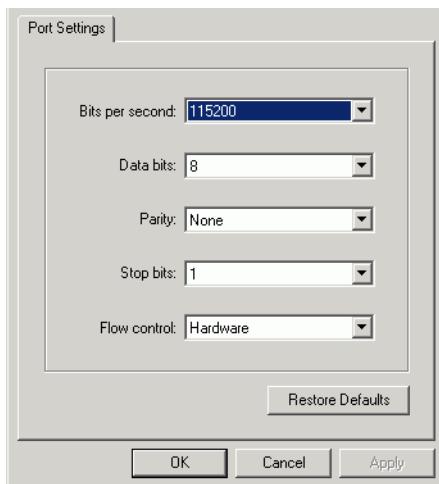
Figure 9: Port Settings dialog box

7. Configure the **Port Settings** parameters as follows:
   — **Bits per second** — 115200
   — **Data bits** — 8
   — **Parity** — None
   — **Stop bits** — 1
   — **Flow control** — Hardware

   When the parameters are set, click **OK**. The HyperTerminal window displays.

8. At the **>** prompt, enter the user-level password (the default is password). The password is case sensitive. The HyperTerminal window displays with a C> prompt at the top of the window (Figure 10).

```
File  Edit  View  Call  Transfer  Help

xxxxxxx
C>ipconfig
MAC Address:     08 00 88 00 15 45
IP Address:      144.49.15.45
Subnet Mask:     255.255.255.0
Gateway Address: 144.49.15.2

C>_

Connected 0:00:50    Auto detect    57600 8-N-1    SCROLL   CAPS   NUM   Capture   Print echo
```
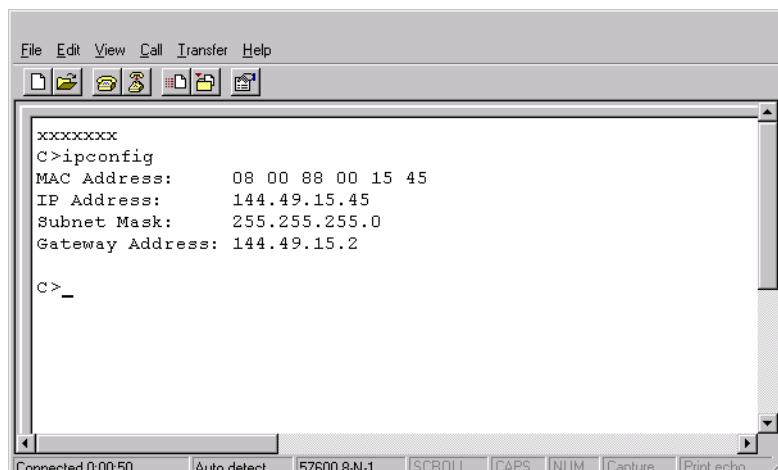
Figure 10: HyperTerminal window

9. At the C> prompt, enter ipconfig. The HyperTerminal window displays with configuration information listed as follows:

   — **MAC Address**
   — **IP Address** (default is 10.1.1.10, factory preset is 10.1.1.10)
   — **Subnet Mask** (default is 255.0.0.0).
   — **Gateway Address** (default is 0.0.0.0)

   Only the **IP Address**, **Subnet Mask**, and **Gateway Address** fields are configurable.

10. Change the IP address, subnet mask, and gateway address as directed by the customer's network administrator. To change switch network addresses, enter the following at the `C>` prompt:.

   ```
   ipconfig xxx.xxx.xxx.xxx yyy.yyy.yyy.yyy zzz.zzz.zzz.zzz
   ```

   The IP address is always `xxx.xxx.xxx.xxx`, the subnet mask is always `yyy.yyy.yyy.yyy`, and the gateway address is always `zzz.zzz.zzz.zzz`, where the octets `xxx`, `yyy`, and `zzz` are decimals from zero through 255. If a network address is to remain unchanged, enter the current address in the respective field.

   When the new network addresses are configured at the switch, the message `Request completed OK` displays at the bottom of the Edge Switch 2/24 — HyperTerminal window.

11. Choose **File > Exit** to close the HyperTerminal window. A message box displays (Figure 11).

Figure 11: Disconnect Now dialog box

12. Click **Yes**. A message box displays (Figure 12).
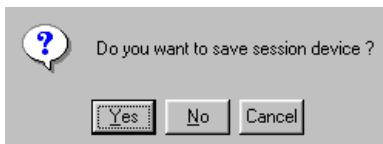
Figure 12: Save Session dialog box

13. Click **No** to exit and close the HyperTerminal dialog box.

14. Power off the maintenance terminal:

   a. Choose **Start > Shut Down**. The Shut Down Windows dialog box displays.

   b. Choose **Shut down the Computer** and click **Yes** to power off the PC.

15. Disconnect the RS-232 null modem cable from the switch and the maintenance terminal. Replace the protective plate over the maintenance port.

LAN-Connect the Switch

Connect the switch to the Ethernet LAN segment or the HP-supplied Ethernet hub as follows:

1. Connect one end of the Ethernet patch cable (supplied with the switch) to the RJ-45 connector (labeled **10/100**) on the left front of the chassis.

2. Connect the remaining end of the Ethernet cable to the LAN as follows:

   a. If the switch is installed on a LAN segment, connect the cable to the LAN as directed by the customer's network administrator.

   b. If the switch is installed on the HP-supplied Ethernet hub, connect the cable to any available port on the hub.

3. Perform one of the following steps:

   ■ If an HAFM appliance is delivered and available, go to "Configure the HAFM Appliance" on page 59.

   ■ If an HAFM appliance is not available and the switch is managed through the EWS interface, attach the Ethernet LAN segment to an Internet connection and go to "Using the Embedded Web Server" on page 95.

Configure the HAFM Appliance

To run HAFM software, you must set up and configure the HAFM appliance.

Refer to the HAFM appliance installation guide for instructions on:

- Setting up the HAFM appliance.
- Connecting the HAFM appliance to the LAN.
- Configuring the network addressing for the HAFM appliance.
- Setting HAFM appliance date and time.
- Creating HAFM user names and passwords

Record or Verify HAFM appliance Restore Information

Configuration information must be recorded to restore the HAFM appliance in case of hard drive failure. The Windows operating system and the HAFM application must also be restored. Refer to the *HP StorageWorks Edge Switch 2/24 Service Manual* for instructions and configuration information.

Enabling HAFM to Manage the Switch

To manage a new switch, it must be identified to the HAFM appliance. To identify the new switch:

1. At the HAFM application (Element manager or EWS main window), select the Setup option from the Discover menu. The Discover Setup dialog box displays (Figure 13).
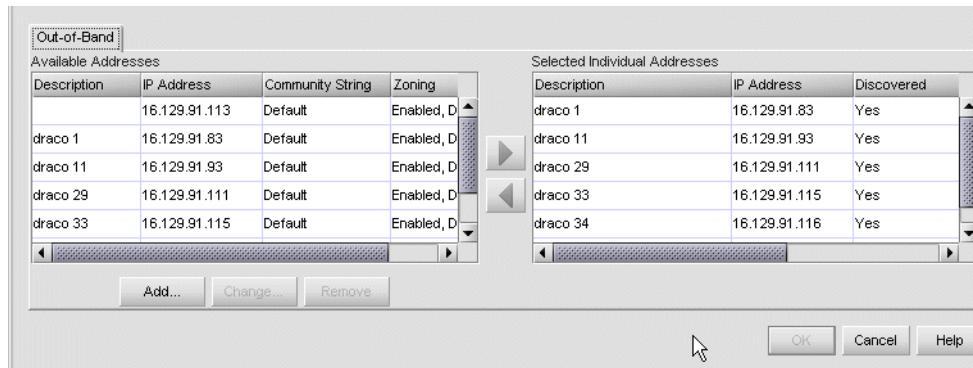
Figure 13: Discover Setup dialog box

2. Click **Add**. The Domain Information dialog box displays with the IP Address page open by default (Figure 14).
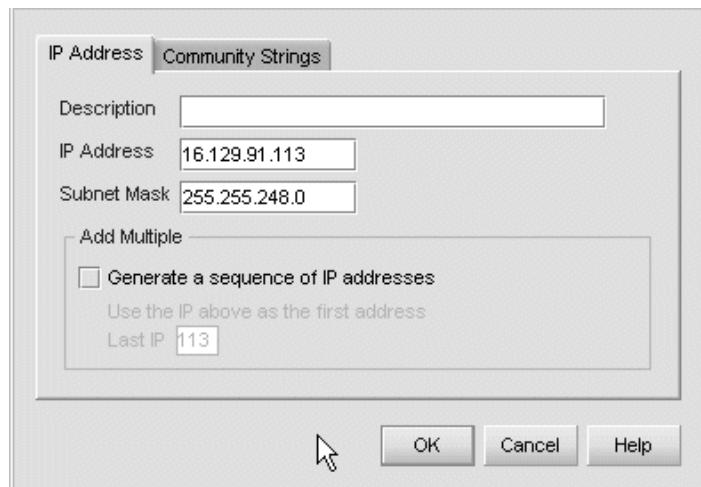
Figure 14: **Domain Information dialog box (IP Address Page)**

3. Enter a switch description (for example, **edge-32)** the Description field.

4. Also, the value for R_A_TOV must be greater than the value configured for E_D_TOV. the switch IP address (determined by the customer's network administrator) in the IP Address field.

5. Also, the value for R_A_TOV must be greater than the value configured for E_D_TOV. the switch subnet mask (determined by the customer's network administrator) in the Subnet Mask field.

6. At the Data Source for Domain area of the dialog box, select the Use auto detection, Use the server, or Use a specific RDC radio button (determined by the customer's network administrator).

7. Click **OK** to save the entered information, close the dialog box, and define the switch to the HAFM application.

8. Repeat step 2 through step 7 for each new switch.

9. Click **OK** to close the Discover Setup dialog box and return to the HAFM application.

Verify Communication Between Switch and HAFM appliance

Communication must be verified between the switch and the HAFM appliance Element Manager and EWS applications.

To verify switch-to-appliance communication:

1. At the HAFM application main window (physical map or product list), inspect the shape and color of the status symbol associated with the Edge Switch product icon. Table 3 explains the symbols and associated operational states.

Table 3: Switch Operational States and Symbols

Operational State	Symbol
Operational—switch-to appliance communication is established, the switch is operational, and no failures are indicated. Go to "Set Switch Date and Time" on page 63.	
Degraded—switch-to-appliance communication is established, but the switch is operating in degraded mode and requires service. This condition is typical if a port or redundant FRU fails. Go to step 2.	
Failed—switch-to appliance communication is established, but the switch failed and requires immediate service. Go to step 2.	
Status Unknown—the switch status is unknown because of a network communication failure between the switch and HAFM appliance. Go to step 2.	

2. Right-click the switch icon at the HAFM application's physical map. A pop-up menu appears.

3. Select the **Element Manager** option from the pop-up menu. When the Element Manager application opens, the last view (tab) accessed by a user opens by default. The example in Figure 15 shows the **Hardware View**.
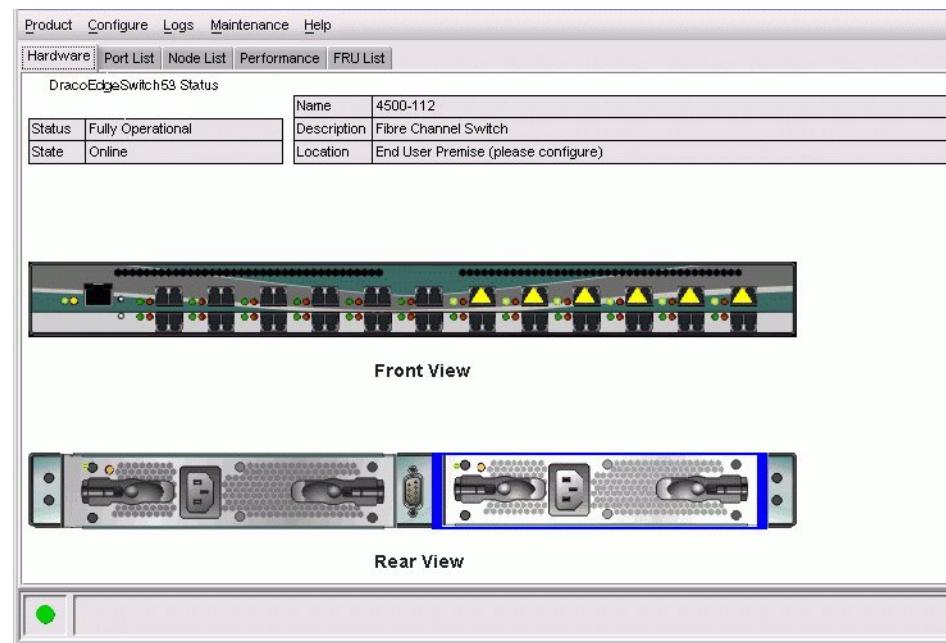
Figure 15: Switch Hardware View page

4. Inspect switch status at the **Hardware View** page and perform one of the following steps:

   a. If the switch displays operational (no FRU alert symbols and a green circle at the alert panel), go to "Set Switch Date and Time" on page 63.

   b. If switch operation displays degraded or a switch failure is indicated (FRU alert symbols and a yellow triangle or red diamond at the alert panel), refer to the *HP StorageWorks Edge Switch 2/24 Service Manual* to isolate the problem.

Set Switch Date and Time

The Edge Switch 2/24 Element Manager log entries are stamped with the date and time received from the switch. To set the effective date and time for the switch:

1. At the **Hardware View** page for the selected switch, choose **Configure > Date/Time**. The Configure Date and Time dialog box displays (Figure 16).

   The switch date and time can be set manually, or set to be periodically updated by the HAFM application (the switch and HAFM application synchronize at least once daily).
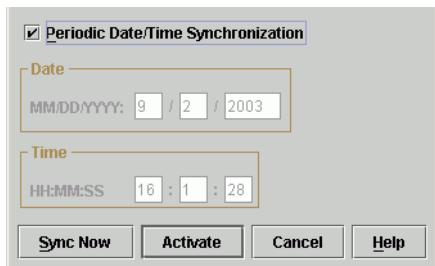
Figure 16: Configure Date and Time dialog box

Set Date and Time Manually

To set the switch date and time manually:

1. At the Configure Date and Time dialog box, click **Periodic Date/Time Synchronization** to deselect the option (no check mark in the box). The greyed out **Date and Time** fields activate.

2. Click the **Date** fields that require change, and type numbers in the following ranges:

   Month (MM): 1 through 12
   Day (DD): 1 through 31
   Year (YY): greater than 1980

3. Click the **Time** fields that require change, and type numbers in the following ranges:

   Hour (HH): 0 through 23
   Minute (MM): 0 through 59
   Second (SS): 0 through 59

4. Click **Activate** to set the switch date and time and close the Configure Date and Time dialog box.

Periodically Synchronize Date and Time

To set the switch to periodically synchronize date and time with the *HAFM* application:

1. Click **Periodic Date/Time Synchronization** to select the option (check mark in the box). The **Date and Time** fields are greyed out and not selectable. Perform one of the following options:

   ■   Click **Activate** to enable synchronization and close the Configure Date and Time dialog box. The switch date and time synchronize with the HAFM application date and time at the next update period (at least once daily).

   ■   Click **Sync Now** to synchronize the switch and HAFM application immediately. The Date and Time Synced dialog box displays.

2. Click **OK** to synchronize the date and time and close the Date and Time Synced dialog box, then click **Activate** to enable synchronization and close the Configure Date and Time dialog box.

Frequently Used HAFM Settings

This section summarizes the most common HAFM tasks, including:

Note: For a complete reference on HAFM functionality, refer to the *HP StorageWorks HA-Fabric Manager User Guide*.

- Set the Switch Online, page 66
- Set the Switch Offline, page 66
- Configure Switch Identification, page 66
- Configure Switch Operating Parameters, page 67
- Configure Fabric Operating Parameters, page 71
- Configure Switch Binding, page 74
- Configure SNMP Trap Message Recipients, page 76
- Configure, Enable, and Test E-mail Notification, page 78
- Configure and Enable Ethernet Events, page 79
- "Configure, Enable, and Test Call Home Event Notification" on page 80
- Configure Threshold Alerts, page 81
- Test Remote Notification, page 87
- Back Up HAFM Configuration Data, page 88
- Configure Open Systems Management Appliance, page 88
- Configure Feature Key, page 88
- Configure Open Trunking, page 88
- Enable Embedded Web Server, page 89
- Enable Telnet, page 89
- Connect Cables to Fibre Channel Ports, page 89

Set the Switch Online

When the switch is set online, an attached device can log into the switch if the port is not blocked. Attached devices can communicate with each other if they are configured in the same zone. Use these steps to set the switch online:

1. Open HAFM. The **Products View** page displays.
2. Double-click the appropriate switch icon. The **Hardware View** page for the selected switch displays.
3. Choose **Maintenance > Set Online State**. If the switch is offline, the **S**et Online State dialog box displays, indicating the status is offline.
4. Click **Set Online**. A **Warning** dialog box displays, indicating status is online.
5. Click **OK**. The Status table displays Online.

Set the Switch Offline

When the Edge Switch 2/24 is set offline, all ports are set offline. The switch transmits the offline sequence (OLS) to attached devices, and the devices cannot log in to the switch. Use these steps to set the switch offline:

1. Notify the customer that the switch is going offline.
2. Open HAFM. The **Products View** page displays.
3. Choose the appropriate switch icon. The **Hardware View** page for the selected switch displays.
4. Choose **Maintenance > Set Online State**. If the switch is online, the Set Online State dialog box displays, indicating the status is Online.
5. Click **Set Offline**. A Warning dialog box displays, indicating the switch will be set offline.
6. Click **OK**.

Configure Switch Identification

Perform this procedure to configure the switch name, description, location, and contact person. The Name, Location, and Contact variables configured here correspond respectively to the SNMP variables sysName, sysLocation, and sysContact. These variables are used by SNMP management workstations when obtaining data from managed switches.

To configure the switch identification:

1. At the Configure window, click the **Switch** tab. The **Switch** page displays with **Identification** tab selected, as shown in Figure 17.
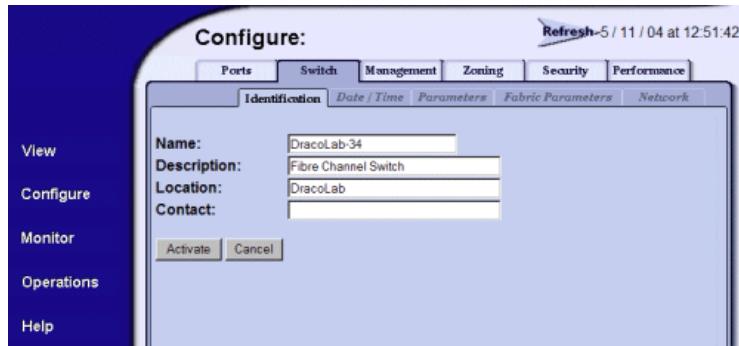
Figure 17: Switch page—Identification tab

a. Enter a switch name of 24 or fewer alphanumeric characters in the **Name** field. Each switch should be configured with a unique name.

    If the switch is installed on a public LAN, the name should reflect the switch's Ethernet network DNS host name. For example, if the DNS host name is hpes224.hp.com, then enter `hpes224`.

b. Enter a switch description of 255 or fewer alphanumeric characters in the **Description** field.

c. Enter the switch physical location (255 or fewer alphanumeric characters) in the **Location** field.

d. Enter the name of a contact person (255 or fewer alphanumeric characters) in the **Contact** field.

2. Click **Activate** to save the information. The message "`Your changes to the identification configuration have been successfully activated`" displays.

Configure Switch Operating Parameters

Use the procedures in this section to set parameters on the switch for fabric operation through the Configure Switch Parameters dialog box. These operating parameters are stored in NVRAM on the switch.

The switch must be offline to change **Preferred Domain ID** and other operating parameters.

1. Ensure that the switch is set offline. For instructions, see "Set the Switch Offline" on page 66.

⚠️ **Caution:** Setting the switch offline terminates all Fibre Channel connections.

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2. Choose **Configure > Operating Parameters > Switch Parameters**. The Configure Switch Parameter**s** dialog box displays (Figure 18).
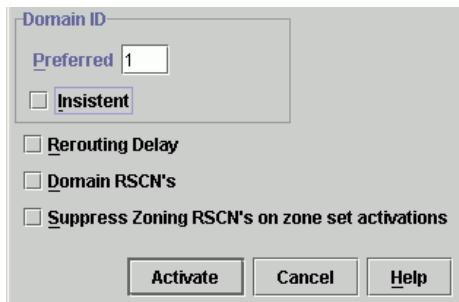
Figure 18: Configure Switch Parameters dialog box

Note: Ordinarily, you do not need to change values in this dialog box from their defaults. The only exception is the **Preferred Domain ID**. Change this value if the switch will participate in a multiswitch fabric.

---

3. Use information in the "Switch Parameters" on page 68" section, which follows, to change settings as required for parameters in this dialog box.

4. After you change settings, click **Activate**.

5. Set the switch online. For instructions, see "Set the Switch Online" on page 66.

Switch Parameters

Configure the following parameters as required by your fabric.

Domain ID

The domain identification is a value from 1 through 31 that provides a unique identification for the switch in a fabric. An Edge Switch cannot contain the same domain ID, as another switch or their E_Ports will segment when they try to join.

In the Configure Switch Parameters dialog box, a field is provided to enter a preferred domain ID and a check box is provided to enable this ID as an insistent domain ID.

Preferred

Note: To change this value, you must first set the switch offline. Choose **Set Online State** from the Maintenance menu to display the **Set Online State** dialog box, then click the button. Be sure to set the switch back online after you change this value.

Use this field to set a unique domain ID for the switch. The default value is 1. Set a value between 1 and 31. When a switch comes online with a preferred ID, it requests an ID from the fabric's principal switch (indicating its preferred value as part of the request). If the requested domain ID is not allocated to the fabric, the domain ID is assigned to the requesting switch. If the requested domain ID is already allocated, an unused domain ID is assigned. Note that you must set the switch offline before you can change to the preferred domain ID.

The preferred domain ID must be unique for each Director and switch in a fabric. If two switches or Directors have the same preferred domain ID, the E_Ports segment, causing the fabric to segment.

For more information on domain ID, refer to the section on domain ID assignment for multiswitch fabrics in the *HP StorageWorks High Availability SAN Planning Guide*.

Insistent

This option is not supported unless the SANtegrity feature is installed. Click the check box to remove or add a check mark. The default state is disabled (no check mark).

When a check mark displays, the domain ID configured in the **Preferred Domain ID** field will become the active domain identification when the fabric initializes. See the following notes:

■ This option is required if High Availability Fabric Manager (HAFM) is enabled.

■ If you enable Insistent Domain while the switch or Director is online, the Preferred Domain ID will change to the current active domain ID if the IDs are different.

⚠ **Caution:** If a switch with a duplicate domain ID exists in the fabric, both switches' E_Ports will segment when they try to join.

Rerouting Delay

Placing a check mark in the check box to the left of the **Rerouting Delay** option enables rerouting delay. This option is only applicable if the configured switch is in a multiswitch fabric. The default state is disabled.

Enabling the rerouting delay ensures that frames are delivered in order through the fabric to their destination. If there is a change to the fabric topology that creates a new path (for example, a new switch is added to the fabric), frames may be routed over this new path if its hop count is less than a previous path with a minimum hop count. This may result in frames being delivered to a destination out of order since frames sent over the new, shorter path may arrive ahead of older frames still in route over the older path.

If rerouting delay is enabled, traffic ceases in the fabric for the time specified in the **E_D_TOV** field of the Configure Fabric Parameters dialog box. This delay allows frames sent on the old path to exit to their destination before new frames begin traversing the new path.

Note: This option is required if you are using the HAFM appliance.

Domain RSCNs

Domain register for state change notifications (domain RSCNs) are sent between end devices in a fabric to provide additional connection information to host bus adapters (HBA) and storage devices. As an example, this information might be that a logical path has been broken because of a physical event, such as a fiber optic cable being disconnected from a port. Consult with your HBA and storage device vendor to determine if enabling Domain RSCNs will cause problems with your HBA or storage products. Note that this option is required if Enterprise Fabric Mode (optional SANtegrity binding feature) is enabled.

Suppress RSCNs on zone set activations

Fabric format domain register for state change notifications (RSCNs) are sent to ports on the switch following any change to the fabric's active zone set. These changes include activating and deactivating the zone set, or enabling and disabling the default zone. When the Suppress RSCNs on Zone Set Activations check box is selected, fabric format RSCNs are not sent for zone changes to the attached devices on the switch. Click the check box to remove or add a checkmark.

This option is enabled (check box not selected) by default. In most cases this option should be enabled so that attached devices can receive notification of zoning changes in the fabric. However, some HBAs may log out, then log back into the fabric when they receive an RSCN, thereby disrupting Fibre Channel traffic. Consult with your HBA and storage device vendor to determine if disabling this option (and thereby enabling RSCN transmission) will cause problems with your HBA or storage products.

Configure Fabric Operating Parameters

Use procedures in this section to set parameters on the switch for fabric operation through the Configure Fabric Parameters dialog box. These operating parameters are stored in NV-RAM on the switch.
The switch must be offline to change parameters in this dialog box.

1. Ensure that the switch is set offline. For instructions, see "Set the Switch Offline" on page 66.

⚠ **Caution:** Setting the switch offline terminates all Fibre Channel connections.

2. At the Hardware View, choose **Operating Parameters > Fabric Parameters** from the Element Manager window. The Configure Fabric Parameters dialog box displays (Figure 19).
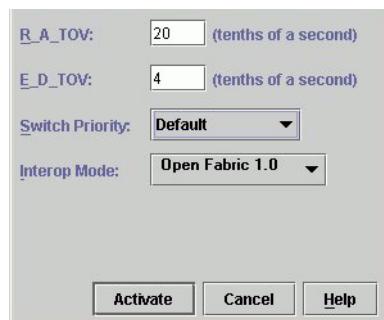
Figure 19: Configure Fabric Parameters dialog box

Note: Ordinarily, you do not need to change values in this dialog box from their defaults. The only exception is the Preferred Domain ID. Change this value if the switch will participate in a multiswitch fabric.

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3. Use information under "Fabric Parameters" on page 72 to change settings as required for parameters in this dialog box.

4. After you change settings, click the **Activate** button.

5. Back up the configuration data when you are finished configuring the switch.

6. Set the switch online. For instructions, see "Set the Switch Online" on page 66.

Fabric Parameters

Configure the following parameters as required by your fabric.

BB_Credit

Configure the switch to support buffer-to-buffer credit (BB_Credit) from 1 through 60. This is the value used for all ports, except those configured for extended distance buffering (10-100 km). The default value is 16. For a description of the buffer-to-buffer credit, refer to the industry specification, *Fibre Channel Physical and Signaling Interface*.

R_A_TOV

Configure resource allocation time-out value (R_A_TOV) in tenth-of-a-second increments. This variable works with the error detect time-out value (E_D_TOV) variable to control the switch's behavior when an error condition occurs.

Resources are allocated to a circuit when errors are detected and are not released for reuse until the time set by the R_A_TOV value expires. The default value is 100 tenths (10 seconds). Set a value between 10 tenths and 1200 tenths (1 through 120 seconds).

Note: Set the same value for R_A_TOV on all Directors and switches in a multiswitch fabric. If the value is not the same on all units, the fabric segments. Also, the value for R_A_TOV must be greater than the value configured for E_D_TOV.

E_D_TOV

Adjust the E_D_TOV in tenth-of-a-second increments. An error condition occurs when an expected response is not received within the time limit set by this value. The default value is 20 tenths (2 seconds). Set a value between 2 tenths through 600 tenths (.2 through 60 seconds).

Note: Set the same value for E_D_TOV on all switches and Directors in a multiswitch fabric. If the value is not the same, the fabric segments. Also, the value for E_D_TOV must be less than the value configured for R_A_TOV.

Switch Priority

Setting this value determines the principal switch for the multiswitch fabric. Choose **Principal** (highest priority), **Default**, or **Never Principal** (lowest priority) from the **Switch Priority** drop-down list.

Setting these priority values determines the principal switch selected for the multiswitch fabric. For example, if you have three switches in the fabric and set one as **Principal**, one as **Default**, and one as **Never Principal**, the unit set to **Principal** becomes the principal switch in the fabric.

If all switches are set to **Principal** or **Default**, the switch with the highest priority and the lowest WWN becomes the principal switch. Following are some examples of principal switch selection when switches have these settings:

- If you have three switches and set all to **Default**, the switch with the lowest WWN becomes the principal switch.

- If you have three switches and set two to **Principal** and one to **Default**, the switch with the **Principal** setting that has the lowest WWN becomes the principal switch.

■　If you have three switches and set two to **Default** and one to **Never Principal**, the switch with the **Default** setting and the lowest WWN becomes the principal switch.

At least one switch in a multiswitch fabric needs to be set as **Principal** or **Default**. If all of the switches are set to **Never Principal**, all of the interswitch links (ISLs) will segment. If all but one switch is set to **Never Principal** and the switch that was principal goes offline, then all of the other ISLs will segment.

Note: HP recommends that you leave the switch priority setting as Default. If you are considering setting this value to something other than default, refer to the section on principal switch selection for multiswitch fabrics in the *HP StorageWorks SAN Planning Guide* for details.

In, for example, the audit log, you may notice that the **Principal** setting maps to a number code of 1, **Default** maps to a number code of 254, and **Never Principal** maps to a number code of 255. The number codes of 2-253 are not currently in use.

Interop Mode

Select one of the following options:

■　**Homogeneous Fabric**—Select this mode if the fabric contains only HP Directors and switches that are operating in Homogeneous Fabric mode.

■　**Open Fabric 1.0**—Default. Select this mode if the fabric contains HP Directors and switches, as well as other open-fabric compliant switches. Select this mode for managing heterogeneous fabrics.

Configure Switch Binding

This feature is managed through the **Switch Binding** submenu options available on the Element Manager Configure menu. Using **Switch Binding**, you can specify devices and switches that can attach to Director and switch ports. This provides security in environments that include a large number of devices by ensuring that only the intended set of devices attach to a switch or Director. For complete procedures on configuring this optional feature, refer to *HP StorageWorks Edge Switch 2/24 Element Manager User Guide*.

The preferred path feature lets you specify and configure one or more ISL data paths between multiple directors or switches in a fabric. Each participating director or switch must be configured as part of a desired path. The following rules apply when configuring a preferred path:

■   The switch domain ID must be set to *Insistent*. For instructions, refer to "Configure Switch Operating Parameters" on page 67.

■   Domain IDs range between **1** through **31**.

■   Source and exit port numbers are limited to the range of ports available on the director or switch (**0** through **23**).

■   For each source port, only one path is defined to each destination domain ID.

Note: Activating a preferred path can result in receipt of out-of- order frames if the preferred path differs from the current path, if input and output (I/O) is active from the source port, and if congestions is present on the current path.

To configure one or more preferred paths for the switch:

1.   Ensure that the preferred path PFE key is installed and configured. For instructions, refer to "Configure Feature Key" on page 88.

2.   At the Hardware View, choose **Configure > Preferred Path**. The Configure Preferred Path*s* dialog box displays (Figure 20).
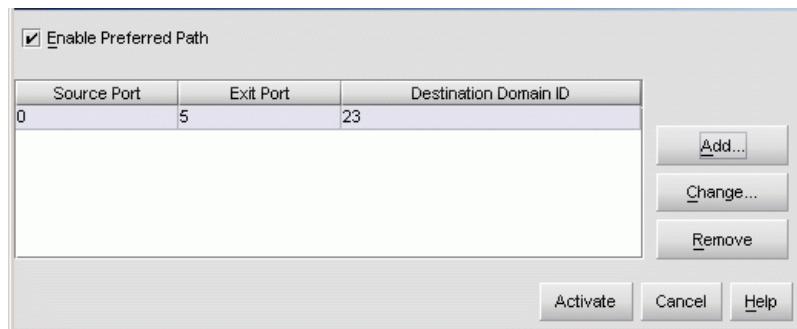

Figure 20: Configure Preferred Paths dialog box

3. Click **Add**. The Add Preferred Path dialog box displays (Figure 21).
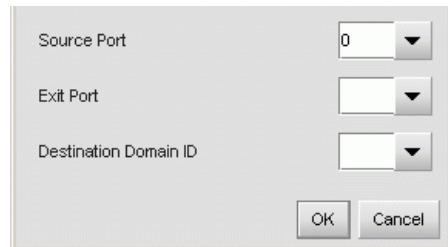
Figure 21: Add Preferred Path dialog box

4. At the **Source Port** field, type a value between **0** through **23**. For this switch, the value uniquely identifies the starting port for the preferred path.

5. At the **Exit Por***t* field, type a value between **0** through **23**. For this switch, the value uniquely identifies the exit port for the preferred path.

6. At the **Destination Domain ID** field, type a value between **1** through **31**. This value uniquely identifies the destination director or switch in the path.

7. Click **OK** to close the Add Preferred Path dialog box and add the path to the list at the Configure Preferred Paths dialog box.

8. Repeat step 3 through step 7 to configure additional preferred paths.

9. At the Configure Preferred Paths dialog box, select (click) the **Enable Preferred Path** check box.

10. Click **Activate** to enable all configured preferred paths and close the dialog box.

Configure SNMP Trap Message Recipients

Perform this procedure to configure community names, write authorizations, and network addresses and for up to 12 SNMP trap message recipients on the HAFM appliance. A trap recipient is a management workstation that receives notification (through SNMP) if a switch event occurs.

To configure SNMP trap recipients:

1. At the **Hardware View** page for the selected switch, choose **Configure >
    SNMP Agent**. The Configure SNMP Agent dialog box displays (Figure 22).
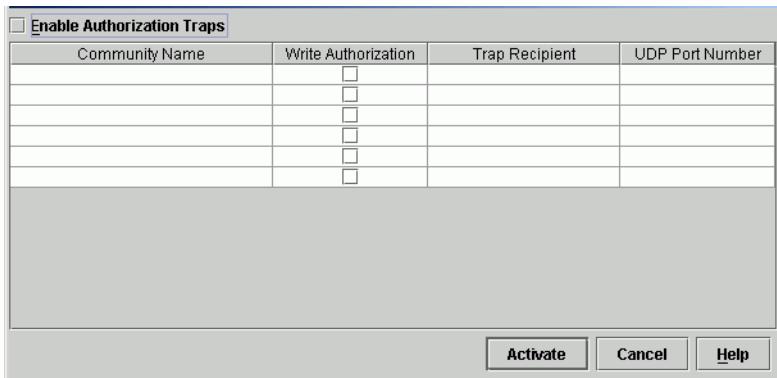
Figure 22: Configure SNMP Agent dialog box

a. For each trap recipient to be configured, enter a community name of 64 or
    fewer alphanumeric characters in the associated **Community Name** field.
    The community name is incorporated in SNMP trap messages to ensure
    against unauthorized viewing or use.

b. Click the check box in the **Write Authorization** column to enable or
    disable write authorization for the trap recipient (default is disabled). A
    check mark in the box indicates write authorization is enabled. When the
    feature is enabled, a management workstation user can change the HAFM
    appliance's `sysContact`, `sysName`, and `sysLocation` SNMP
    variables.

c. Enter the IP address or DNS host name of the trap recipient (SNMP
    management workstation) in the associated **Trap Recipient** field. Use 32
    or fewer alphanumeric characters. It is recommended that the IP address
    be used.

d. The default user datagram protocol (UDP) port number for trap recipients
    is `162`. Enter a decimal port number in the associated **UDP Port
    Number** field to override the default.

2. To enable transmission of trap messages to configured SNMP management
    workstations, click **Enable Authorization Traps**. A check mark displays in
    the box when transmission is enabled (Figure 23).
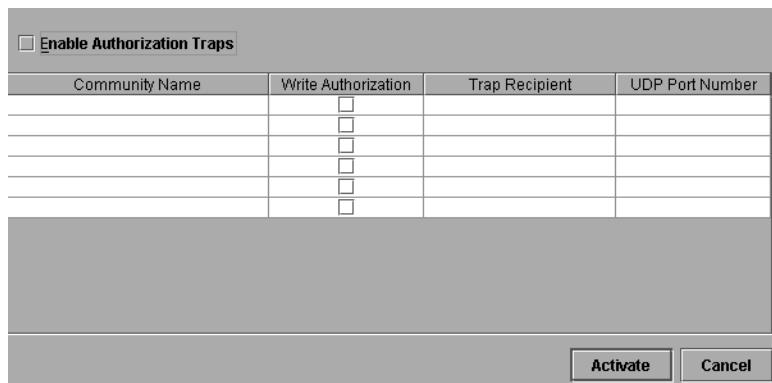
Figure 23: Configure SNMP dialog box—Enable Authorization Traps

3. Click **Activate** to save the information and close the dialog box.

Configure, Enable, and Test E-mail Notification

Perform this procedure to configure, enable, and test e-mail and simple mail transfer protocol (SMTP) addresses to receive notification of switch (and other product) events. Configure and test procedures are performed at the HAFM appliance. E-mail notification is enabled for each switch at the HAFM application.

To configure, enable, and test e-mail server addresses:

1. Minimize the **Hardware View** and return to the HAFM application.

2. At the HAFM application or EWS main window, choose **Monitor > Event Notification and E-mail options**. The E-mail Event Notification Setup dialog box displays (Figure 24).

Figure 24: Configure E-Mail dialog box

3. Enter the IP address or DNS host name of the SMTP server in the **E-mail Server** field. Use 64 or fewer alphanumeric characters. It is recommended that the IP address be used.

4. Enter the e-mail address to which e-mail replies should be sent in the **Reply** field.

5. At the **Interval field**, type the length of time the application should wait between notifications. Choose seconds, minutes, or hours from the associated drop-down list.

6. To configure event types for which e-mail notification is sent, select (click) the **Filter** link adjacent to the check box. The Define Filter dialog box displays. For instructions on defining event filters, refer to the *HP StorageWorks Edge Switch 2/24 Element Manager User Guide*.

Note: The enable function must also be activated for each switch through the Edge Switch 2/24 Element Manager application. E-mail notification can be active for some switches and inactive for others.

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7. Click **OK** to save the information and close the dialog box.

8. Click **Test E-mail**. A test message is sent to configured e-mail recipients.

9. Click **OK** to save the information and close the E-mail Event Notification Setup dialog box.

10. At the **Hardware View** page for the selected switch, choose **Maintenance > Enable E-Mail Notification**. A check mark displays in the check box to indicate e-mail notification for the switch is enabled, and the menu closes.

Configure and Enable Ethernet Events

Perform this procedure to configure and enable Ethernet events. An Ethernet event is recorded (after a user-specified time interval) when the switch-to-HAFM appliance communication link drops. To configure and enable Ethernet events:

1. Minimize the **Hardware View** and return to the HAFM application.

2. At the HAFM or EWS main window, select the **Monitor > Ethernet Event**. The Configure Ethernet Events dialog box displays (Figure 25).
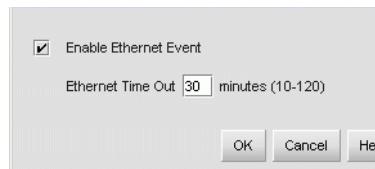
Figure 25: Configure Ethernet Events dialog box

3. Click the **Enable Ethernet Events** check box. A check mark displays in the check box to indicate Ethernet events are enabled.

4. Also, the value for R_A_TOV must be greater than the value configured for E_D_TOV. a value from 10 through 120 minutes in the **Ethernet Timeout** field.

5. Click **OK** to close the dialog box.

Configure, Enable, and Test Call Home Event Notification

Telephone numbers and other information for the call-home feature are configured through the Windows dial-up networking application. To learn more about configuring Call-Home features, refer to the *HP StorageWorks Edge Switch 2/24 Service Manual*. To configure, enable, and test call home event notification:

1. Minimize the **Hardware View** and return to the HAFM application.

2. At the HAFM or EWS main window, select the **Event Notification** and **Call Home** options from the Monitor menu. The Call Home Event Notification Setup dialog box displays (Figure 26).
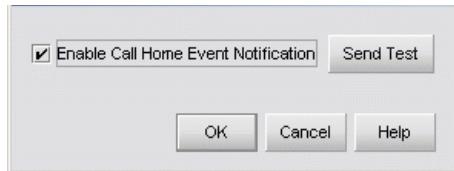

Figure 26: Call Home Event Notification Setup dialog box

3. Click the **Enable Call Home Event Notification** check box. A check mark displays in the check box to indicate call-home event notification is enabled.

> **Note:** The enable function must also be activated for each switch through the Element Manager application. Call-home event notification can be active for some switches and inactive for others.

4. Click **Send Test**. A call-home test message is sent.

5. Click **OK** to close the dialog box.

6. Maximize the **Hardware View** page.

7. At the **Hardware View**, select **Enable Call Home Notification** from the Maintenance menu. A check mark appears in the check box to indicate call-home event notification for the switch is enabled, and the menu closes.

Configure Threshold Alerts

A threshold alert notifies users when the transmit (Tx) or receive (Rx) throughput reaches specified values for specific switch ports or port types, (E_Ports or F_Ports).

You are notified of a threshold alert in four ways:

■   A yellow triangle that displays on the port in the **Port Card View**.

■   A yellow triangle that displays on the port in the **Hardware View**.

■   A yellow triangle that displays in the **Alert** column of the **Port List View**.

■   A yellow triangle that displays by the **Threshold Alerts** field in the Port Properties dialog box.

■   Detailed threshold alert data recorded in the Threshold Alert Log.

Use the **Threshold Alerts** option on the Configure menu to configure the following:

■   Name for the alert.

■   Type of threshold for the alert (Rx, Tx, or either).

■   Active or inactive state of the alert.

■ Threshold criteria:

— Percent traffic capacity utilized—The percent of the port's throughput capacity achieved by the measured throughput. This setting constitutes the threshold value. For example a value of 50 means that the port's threshold is reached when throughput is 50% of capacity.

— Time interval during which throughput is measured and alert notification can occur.

— The maximum cumulative time that the throughput percentage threshold can be exceeded during the set time interval before an alert is generated.

■ Ports for which you are configuring threshold alerts.

You can configure up to 16 alerts, and any number of alerts can be active at one time. Use the following procedures to create a new threshold alert, or to modify, activate, deactivate, or delete an alert.

Create New Alerts

1. At the **Hardware View** page, choose **Configure > Threshold Alerts**. The Configure Threshold Alerts dialog box displays, as shown in Figure 27.

Note: If alerts are configured, they will display in table format showing the name of the alert, type of alert (Rx, Tx, or Rx or Tx), and alert state (inactive or active).

Name	Type	State
Transmit Exceed	Transmit	Inactive

New... Modify... View Delete Activate Deactivate Close Help
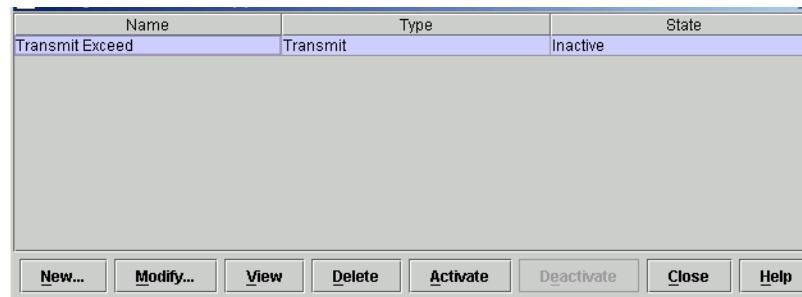
Figure 27: Configure Threshold Alerts dialog box

2. Click **New**. The New Threshold Alert dialog box displays, as shown in Figure 28.

Figure 28: New Threshold Alerts dialog box—**first screen**

3. Enter a name from one to 64 characters in length. All characters in the ISO Latin-1 character set, excluding control characters, are allowed.

4. Choose one of the following from the drop-down list under the **Name** field:

   ■ **Rx Throughput**—An alert will occur if the threshold set for receive throughput is reached

   ■ **Tx Throughput**—An alert will occur if the threshold set for transmit throughput is reached.

   ■ **Rx or Tx Throughput**—An alert will occur if the threshold set for either receive or transmit throughput is reached.

5. Click **Next**. A new screen displays with additional parameters, as shown in Figure 29. The name configured for the alert displays at the top of the screen.

Note: Click **Previous** if you need to return to the previous screen.

Figure 29: New Threshold Alerts dialog box—second screen

6. Enter a percentage from 1 through 100 for % utilization. When throughput reaches this percentage of port capacity, a threshold alert will occur.

7. Enter the amount of cumulative minutes in which the % utilization should exist during the notification interval before an alert is generated. You can also choose **At any time** if you want an alert to occur whenever the set % utilization is reached. The valid range is from 1 to the interval value set in step 8.

8. Enter the interval in minutes in which throughput is measured and threshold notifications can occur. The valid range is 5 minutes to 70,560 minutes.

9. Click **Next**. A new screen displays for selecting ports for the alerts, as shown in Figure 30.
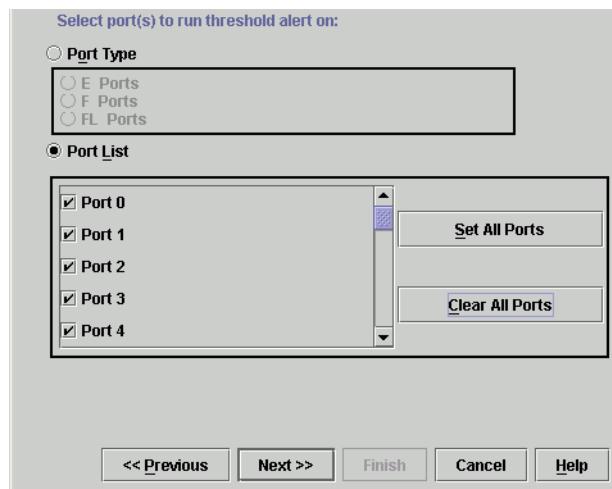
Figure 30: New Threshold Alerts dialog box—third screen

10. Choose either **Port Type** or **Port List**.

   ■   For **Port Type**, choose either E_Ports or F_Ports will cause this alert to
       generate for all ports configured as E_Ports or F_Ports respectively.

   ■   For **Port List**, you can choose individual ports by clicking the check box
       by each port number or set all ports. Selecting **Set All Ports** places a
       check mark by each port number. Selecting **Clear All Ports** will clear the
       check marks by each port number.

11. Click **Next**. A final screen displays to provide a summary of your alert
    configuration, as shown in Figure 31.
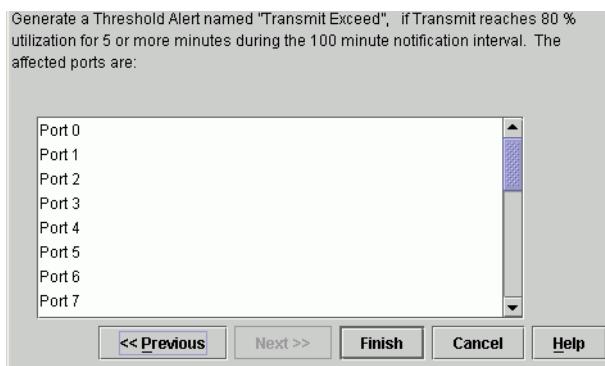
Figure 31: New Threshold Alerts dialog box—summary screen

12. Click **Finish**. The Configure Threshold Alerts dialog box displays listing the name, type, and state of the alert that you just configured.

13. At this point, the alert is not active. To activate the alert, choose the alert information that displays in the Configure Threshold Alerts table and click **Activate**. The alert is activated as shown in Figure 32.

Name	Type	State
Port 26 Alert	Tx Throughput	Active
test 2	Tx or Rx Throughput	Inactive
test threshold	Tx or Rx Throughput	Active

| New... | Modify... | View | Delete | Activate | Deactivate | Close |

Figure 32: Configure Threshold Alerts dialog box—alert activated

Modify Alerts

Use the following steps to modify an existing threshold alert configuration.

1. At the **Hardware View** page, choose **Configure > Threshold Alerts**. The Configure Threshold Alerts dialog box displays.

   Select the alert that you want to modify by clicking the alert information in the table. If the alert is active, an error message displays prompting you to deactivate the alert.

2. If the alert is active, click **Deactivate**, then choose the alert information in the table again.

3. Click **Modify**. An initial **Modify Threshold** screen displays where you can change the threshold type.

4. Select a threshold type from the drop-down list.

5. Click **Next** when you are done. A **Modify Threshold** screen displays where you can change the % utilization, cumulative minutes for the threshold to occur before notification, and the time interval for measuring throughput and for alert notification.

6. Make appropriate changes, then continue through the **Modify Threshold** screens, making changes as necessary, until the summary screen displays the alert configuration.

7. Perform either of the following steps:

   - If you need to change any parameters, click **Previous** or **Next** to display the desired **Modify Threshold** screen.

   - Click **Finish** when you are done.

Activate or Deactivate Alerts

Use the following steps to activate or deactivate existing threshold alerts. In the active state, notifications are generated for the alert. In the inactive state, notifications do not occur.

1. At the **Hardware View** page, choose **Configure > Threshold Alerts**. The Configure Threshold Alerts dialog box displays.

   The port's current state, inactive or active, is listed under the **State** column.

2. To change the state, choose the alert by the alert information in the table.

3. If the alert is active, choose **Deactivate** to change to the inactive state. If the alert is inactive, choose **Activate** to change to the active state.

Delete Alerts

Use the following steps to delete existing threshold alerts.

1. At the **Hardware View** page, choose **Configure > Threshold Alerts**. The Configure Threshold Alerts dialog box displays.

2. Select the alert that you want to delete by selecting the alert information in the table and click **Delete**. A message displays asking you to confirm the deletion.

3. Click **Yes**. The alert is removed from the dialog box.

Test Remote Notification

4. At the **Product View** page, choose **Maintenance > Test Remote Notification**. The Test Remote Notification dialog box displays (Figure 33).
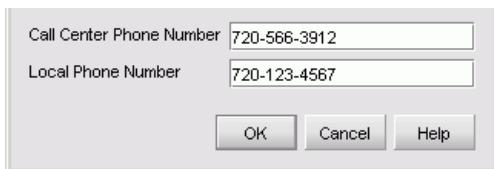
Figure 33: Test Remote Notification dialog box

5. Choose **Enable Call Home Event Notification** to perform applicable tests.

   The call home test provides a test notification message to a remote support center. Depending on the option chosen during HAFM installation, the test notification message is transmitted over telephone lines or LAN.

6. Click **Send Test**. Call-home and e-mail test messages are transmitted. Click **OK** to close the dialog box.

7. Maximize the **Hardware View**.

8. At the **Hardware View**, select **Enable Call Home Notification** from the Maintenance menu. A check mark displays a check box to indicate call-home event notification for the switch is enabled, and the menu closes.

Back Up HAFM Configuration Data

It is important to back up the HAFM configuration data. This data is used to restore the HAFM appliance See the *HP StorageWorks Edge Switch 2/24 Service Manual* for instructions on backing up the HAFM configuration data.

Once the HAFM configuration data is backed up, go to "Connect Cables to Fibre Channel Ports" on page 89.

Configure Open Systems Management Appliance

For complete procedures on configuring this optional feature, refer to *HP StorageWorks Edge Switch 2/24 Element Manager User Guide*.

Configure Feature Key

For complete procedures on configuring this feature, refer to *HP StorageWorks Edge Switch 2/24 Element Manager User Guide*.

Configure Open Trunking

This option is only available if the optional Open Trunking feature is installed. Choosing this option opens the Configure Open Trunking dialog box. For details on enabling Open Trunking and configuring such parameters as congestion thresholds for ports, event notification options, and low BB credit threshold, refer to *HP StorageWorks Edge Switch 2/24 Element Manager User Guide*.

Enable Embedded Web Server

Use the following steps to enable EWS:

1. At the **Hardware View** page, choose **Configure > Enable Web Server**. Choosing **Enable Web Server** automatically places a check mark in the check box.

2. Choose **Enable Web Server** again to remove the check mark and disable the EWS interface. When disabled, remote users cannot access the interface.

   For detailed information on using EWS, see "Using the Embedded Web Server" on page 95.

Enable Telnet

Use the following steps to enable Telnet:

1. At the **Hardware View**, choose **Configure > Enable Telnet**. Choosing **Enable Telnet** automatically places a check mark in the check box.

2. Choose **Enable Telnet** again to remove the check mark and disable telnet access. When disabled, remote users cannot access the Edge Switch through telnet.

Connect Cables to Fibre Channel Ports

Perform this task to connect devices to the switch. To cable Fibre Channel ports:

1. Route single mode or multimode fiber optic cables (depending on the type of SFP pluggable optic transceivers installed) from customer-specified devices to ports at the front of the switch.

2. Connect device cables to small form factor pluggable (SFP) transceivers. Start with port 0 and continue sequentially to the left through port 23.

3. Perform one of the following:

   a. If the switch is installed on a table or desk top, bundle and secure the Fibre Channel cables as directed by the customer.

   b. If the switch is installed in a customer-supplied equipment rack, bundle Fibre Channel cables from the switch and other equipment (groups of 16 maximum), and secure them as directed by the customer.

4. Set the switch online.

Connect the Switch to a Fabric

To provide Fibre Channel connectivity between public devices and fabric-attached devices, connect the switch to an expansion port (E_Port) of an HP Director or Edge Switch. The switch port to switch port connection is called an interswitch link (ISL). To fabric-attach the Edge Switch and create an ISL:

1. Ensure that the Edge Switch is defined to the *HAFM* application (defined while performing "Enabling HAFM to Manage the Switch" on page 59.

2. Ensure that the preferred domain ID for the Edge Switch is unique and does not conflict with the ID of another Edge Switch participating in the fabric. To change the domain ID, see "Configure Switch Operating Parameters" on page 67.

3. Ensure that the R_A_TOV and E_D_TOV values for the Edge Switch are identical to the values for all Edge Switches participating in the fabric. To change the values, see "Configure Fabric Operating Parameters" on page 71.

4. Route a multimode or single mode fiber optic cable (depending on the type of SFP transceiver installed) from a customer-specified E_Port of the switch to the switch.

5. Connect the switch-attached fiber optic cable to the port SFP transceiver.

6. If the Edge Switch is managed by an attached HAFM appliance, go to step 7. If the Edge Switch is managed by the Embedded Web Server interface:

   a. Choose **View** at the left side of the window. The View window opens with the **Switch** tab selected and displayed.

   b. At the View window, click the **Port Properties** tab. The **Port Properties** page displays with **0** selected, and port information listed for port 0.

   c. Choose the port number of the port used to make this ISL connection.

   d. Ensure that the **Operational State** field displays **Online** and the **Reason** field displays **N/A** or is blank. If an ISL segmentation or other problem is indicated, refer to the *HP StorageWorks Edge Switch 2/24 Service Manual* to isolate the problem. If no problems are indicated, installation tasks are complete.

7. At the HAFM appliance's **Product View** page, double-click the Edge Switch icon. The **Hardware View** page for the selected Edge Switch displays.

8. Double-click the port connector used to make this ISL connection to open the Port Properties dialog box (Figure 34).

Port Number	2
Port Name	
Type	F_Port
Operating Speed	1 Gig
Port WWN	Draco-20:06:08:00:88:00:21:00
Block Configuration	Unblocked
LIN Alerts Configuration	On
FAN Configuration	Off
Beaconing	Off
Link Incident	None
Operational State	Online
Reason	
Threshold Alert	

Close   Help
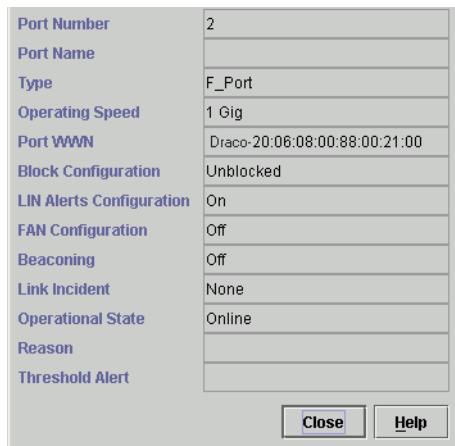
Figure 34: Port Properties dialog box

9. Ensure that the **Link Incident** field displays **None** and the **Reason** field is blank. If an ISL segmentation or other problem is indicated, refer to the *HP StorageWorks Edge Switch 2/24 Service Manual* to isolate the problem. If no problems are indicated, installation tasks are complete.

Note: If the Open Trunking feature is installed an additional field (**Congested Threshold %**) displays in the Port Properties dialog box. This field displays the active congested threshold percentage currently configured in the Configure Open Trunking dialog box.

Unpack, Inspect, and Install the Ethernet Hub (Optional)

The HAFM appliance and one or more Edge Switches connect through an Ethernet hub installed on a 10/100 Mbps LAN segment. One hub port is required to connect the HAFM appliance, and one hub port is required to connect each Edge Switch. A combination of up to 48 HP products can be configured and managed by a single HAFM appliance, therefore multiple hubs may be required to provide sufficient port connections. These hubs must be connected in accordance with the hub manufacturer's specifications. HP recommends using a star or hub-and-spoke topology when connecting multiple hubs. The HAFM appliance must be connected to the center hub, and there should never be more than two hubs between the HAFM appliance and any Edge Switch. Refer to the hub manufacturer's documentation for more detailed information.

For instructions to unpack and inspect one or more Ethernet hubs, and to install the hubs in a desktop or rack-mount configuration, refer to the appropriate Ethernet hub documentation.

Using HAFM from a Remote Location

Use this section to install the HAFM client on a remote workstation.

Remote Workstation Minimum Requirements

The minimum requirements described in "Minimum Remote Workstation Requirements" on page 29 must be met to install HAFM on a remote workstation.

Note: For HAFM to function properly, compatible versions must be installed on both the client machines and the HAFM appliance.

Install HAFM Client on a Remote Workstation

Use these steps to install HAFM on a remote client:

1. Verify that the workstation and the Ethernet LAN segment (with the Edge Switch 2/24 attached) are connected through the Internet.

2. At the workstation, launch the browser application.

3. At the browser, enter the HAFM appliance IP address.

4. The HAFM splash screen displays with the following options, see Figure 35.

   a. **Install HAFM remote client application**—Choose this option to install the application for your workstation platform.

   b. **Download SNMP MIB files**—The Management Information Base (MIB) files are provided in standard ASN.1 syntax and may be installed into the MIB database of any SNMPv2-compliant Network Management Station.
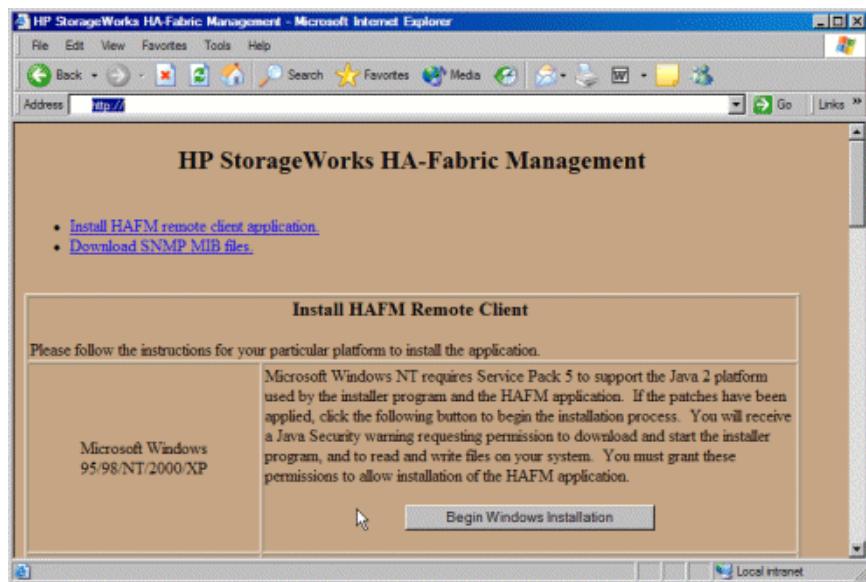
Figure 35: HAFM remote client install

5. To install the remote client application, scroll down to the information that pertains to your platform, and follow the instructions provided.

6. After you have downloaded the installer executable, the InstallAnywhere Wizard displays. Follow the instructions provided to continue the installation.

Launch HAFM from the Remote Client

Use these steps to launch HAFM from a remote client:

1. Double-click the **HAFM** icon to launch HAFM. The **HAFM Login** screen displays.

2. Enter the user name and password.

Note: The default user name is *Administrator*. The default password is *password*. Both user name and password are case-sensitive.

---

3. Enter the IP address of the HAFM appliance, or choose an HAFM appliance from the **HAFM appliance** drop-down list. The list includes HAFM appliance to which you have previously logged in.

4. Click **Login**. The HAFM appliance opens.

Using the Embedded Web Server

4

If an HAFM appliance is not available, or is not used to manage the switch, use the Embedded Web Server (EWS) interface to configure the Edge Switch 2/24. Selectively perform the following configuration tasks according to your installation requirements:

■ Configure Switch Ports, page 98

■ Configure Switch and Fabric Parameters, page 102

■ Configure Network Information, page 106

■ Configure SNMP Trap Message Recipients, page 108

■ Enable or Disable the CLI, page 110

■ Configure User Rights, page 111

Note: This chapter describes the initial setup of the Edge Switch 2/24 using the EWS interface. For additional information on configuring more advanced features using EWS, see the online EWS help or the *HP StorageWorks Embedded Web Server User Guide*.

Accessing the Embedded Web Server

A PC platform with LAN access and standard web browser running Netscape Navigator 4.6 or later or Microsoft Internet Explorer 4.0 or later is required.

To open the Embedded Web Server interface:

1. Ensure that the browser-capable PC and the Ethernet LAN segment (with the switch attached) are connected.

2. At the PC, launch the browser application (Netscape Navigator or Internet Explorer).

3. At the browser, enter the IP address of the switch as the Internet uniform resource locator (URL). Use the default IP address of 10.1.1.10, the factory preset of 10.1.1.10, or the IP address configured while performing "Configure Switch Network Information" on page 53. The Username and Password Required dialog box displays, as shown in Figure 36.

Figure 36: Username and Password Required dialog box

4. Enter the default user name and password.

Note: The default user name is *Administrator* and the default password is *password*. The user name and password are case-sensitive.

---

5. Click **OK**. The Embedded Web Server interface opens with the View window displayed, as shown in Figure 37.
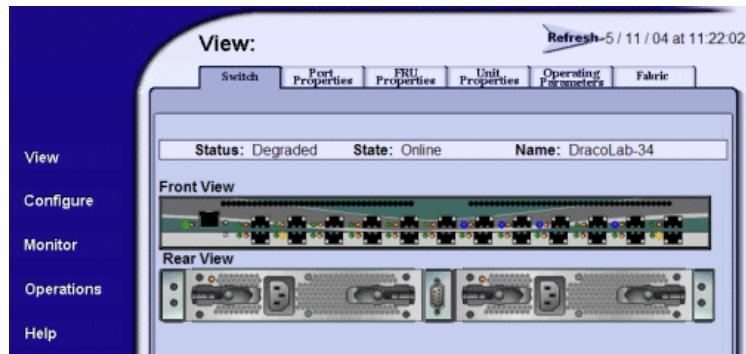
Figure 37: Embedded web server interface—View window

Configure Switch Ports

Perform the procedure in this section to configure names and operating characteristics for the switch ports.

To configure one or more ports:

1. Click **Configure** at the left side of the window. The **Configure** window opens with the **Ports** tab displayed (Figure 38).

   a. For each port to be configured, type a port name of 24 alphanumeric characters or less in the associated **Name** field. The port name should identify the device to which the port is attached.

   b. Click the check box in the **Blocked** column to block or unblock a port (default is unblocked). A check mark in the box indicates the port is blocked. Blocking a port prevents the attached device from communicating with the switch. A blocked port continuously transmits the offline sequence (OLS).

Figure 38: Block or unblock a port from the Configure window

   c. Click the check box in the **FAN** column to enable or disable the fabric address notification (FAN) feature (default is enabled). A check mark in the box indicates FAN is enabled. When the feature is enabled, the port transmits FAN frames after loop initialization to verify that FC-AL devices are still logged in. HP recommends this option be enabled for ports configured for loop operation.

    d. Choose the port type from the **Type** drop-down list. Available selections are:

      — Generic mixed port (**GX_Port**) - Use this selection to configure a port as a generic loop port (GL_Port). This selection is available only if enabled through an optional feature key.

      — Fabric mixed port (**FX_Port**) - Use this selection to configure a port as a fabric loop port (FL_Port).

      — Generic port (**G_Port**) - This selection is available only if enabled through an optional feature key.

      — Fabric port (**F_Port**).

      — Expansion port (**E_Port**) - This selection is available only if enabled through an optional feature key.

    e. Choose the port speed from the **Speed** drop-down list. Available selections are:

      — **Negotiate** - Auto-negotiate between 1.0625 and 2.125 gigabit per second (Gbps) operation. This is the default selection.

      — **1 Gb/sec** - 1.0625 Gbps operation.

      — **2 Gb/sec** - 2.125 Gbps operation.

2. Click **Activate** to save the information. The message "`Your changes to the Port configuration have been successfully activated`" displays.

Configure Switch Identification

Perform this procedure to configure the switch name, description, location, and contact person for the HAFM application. The information displays in multiple dialog boxes throughout the application. In addition, the Name, Location, and Contact variables configured at the **Configure Identification** dialog box correspond respectively to the SNMP variables sysName, sysLocation, and sysContact. These variables are used by SNMP management workstations when obtaining data from managed switches.

To configure the switch identification:

1. At the **Configure** window, click the **Switch** tab. The **Switch** page displays with the **Identification** tab selected (Figure 39).
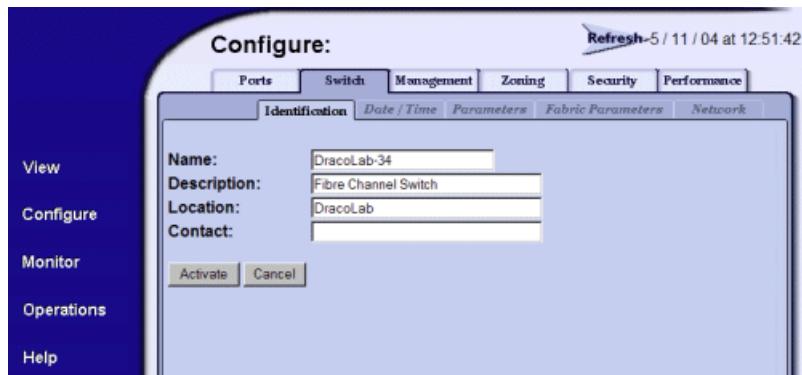
Figure 39: Configure Switch Identification tab

   a. Enter a switch name of 24 or fewer alphanumeric characters in the **Name** field. Each switch should be configured with a unique name.

   If the switch is installed on a public LAN, the name should reflect the switch's Ethernet network DNS host name. For example, if the DNS host name is hpes232.hp.com, enter hpes232.

   b. Enter a switch description (255 or fewer alphanumeric characters) in the **Description** field.

   c. Enter the switch physical location (255 or fewer alphanumeric characters) in the **Location** field.

   d. Enter the name of a contact person (255 or fewer alphanumeric characters) in the **Contact** field.

2. Click **Activate** to configure the switch identification and close the dialog box.

Configure Date and Time

Perform this procedure to configure the effective date and time for the switch. To set the date and time:

1. Choose **Configure** > **Switch** > **Date/Time**. The Switch page displays with a highlighted red **Date/Time** tab selected (Figure 40).
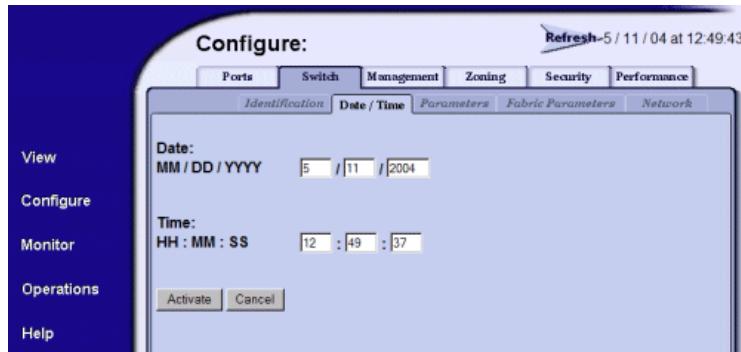
Figure 40: Switch page—Date/Time tab

    a. Click the **Date** fields that require change, and enter numbers in the following ranges:

    Month (MM): 1 through 12
    Day (DD): 1 through 31
    Year (YY): greater than 1980

    b. Click the **Time** fields that require change, and enter numbers in the following ranges:

    Hour (HH): 0 through 23
    Minute (MM): 0 through 59
    Second (SS): 0 through 59

2. Click **Activate** to save the information. The message "Your changes to the Date/Time configuration have been successfully activated" displays.

Configure Switch and Fabric Parameters

Perform this procedure to configure the following switch and fabric operating parameters: Buffer-to-Buffer Credit (BB_Credit), Error Detect Time Out Value (E_D_TOV), and Resource Allocation Time Out Value (R_A_TOV), preferred domain ID, and switch priority.

Configure Switch Parameters

The switch must be set offline to configure operating parameters. To configure the parameters:

1. Set the switch offline as follows:

   a. Choose **Operations >Online State** to display the Online State tab.

   b. Click **Set Offline**. The message "Your changes have been successfully activated" displays.

2. Click **Configure** at the left side of the panel. The **Configure** panel opens with the **Ports** page displayed.

3. Choose **Switch >Parameters** to display the **Operating Parameters** tab (Figure 41).
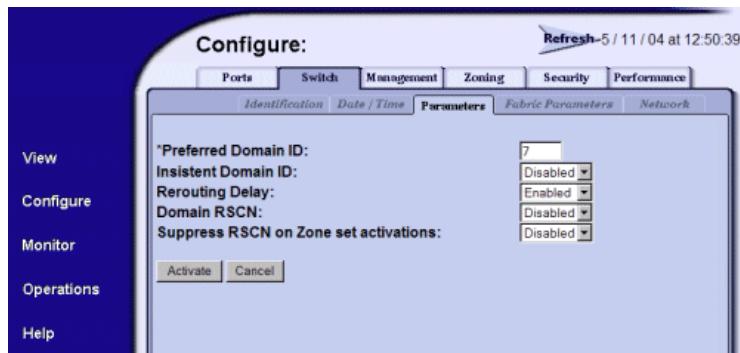
Figure 41: Switch page—Parameters tab

4. Set the switch parameters:

   a. In **Preferred Domain ID**, enter a value between 1 and 31 (default is 1). The domain ID uniquely identifies each switch in a fabric.

   All fabric-attached switches must have unique domain IDs. If the value is not unique, the E_Port connection to the switch segments and the switch cannot communicate with the fabric.

b. Choose **Enabled** or **Disabled** from the **Insistent Domain** drop-down list. The default state is disabled. This option is not supported unless the SANtegrity feature is installed.

If insistent domain is enabled, the domain ID configured in the **Preferred Domain ID** field will become the active domain identification when the fabric initializes.

Note: If you enable **Insistent Domain** while the switch or director is online, the **Preferred Domain ID** will change to the current active domain ID if the IDs are different.

c. Choose **Enabled** or **Disabled** from the **Rerouting Delay** drop-down list. The default state is enabled.

If rerouting delay is enabled, traffic is delayed through a fabric by the specified E_D_TOV time. This delay ensures Fibre Channel frames are delivered to their destination in order, even if a change to the fabric topology creates a new (shorter) transmission path.

d. Choose **Enabled** or **Disabled** from the **Domain RSCNs** drop-down list. The default state is disabled.

Domain register for state change notifications (domain RSCNs) are sent between end devices in a fabric to provide additional connection information to host bus adapters (HBAs) and storage devices. As an example, this information might be that a logical path has been broken because of a physical event, such as a fiber optic cable being disconnected from a port. Consult with your HBA and storage device vendor to determine if enabling Domain RSCNs will cause problems with your HBA or storage products.

e. Choose **Enabled** or **Disabled** from the **Suppress RSCNs on Zone set activations** drop-down list. The default state is disabled.

When the parameter is enabled, attached devices do not receive notification following any change to the fabric's active zone set.

When the parameter is disabled, attached devices (registered through the fabric format domain register) do receive notification following any change to the fabric's active zone set.

5. Click **Activate** to save the information. The message "`Your changes to the Operating Parameters configuration have been successfully activated`" displays.

6. Set the switch online:

   a. Choose **Operations** >**Online State**. The **Operations** page displays with the **Online State** tab selected.

   b. Click **Set Online**. The message "`Your changes have been successfully activated`" displays.

Set Fabric Parameters

The switch must be set offline to configure fabric parameters. To configure the parameters:

1. Set the switch offline as follows:

   a. At the View window, select **Operations** at the left side of the panel. The **Operations** panel opens with the **Switch Beacon** page displayed.

   b. At the **Current State** window, click **Set Offline**. The message `Your operations changes have been successfully activated` displays.

2. At the View window, select **Configure** at the left side of the panel. The **Configure** panel opens with the **Ports** page displayed.

3. At the **Configure** panel, click the **Switch** tab, then select **Fabric Parameters**. The **Switch** page displays with **Fabric Parameters**.

4. Set the fabric parameters (Figure 42):.
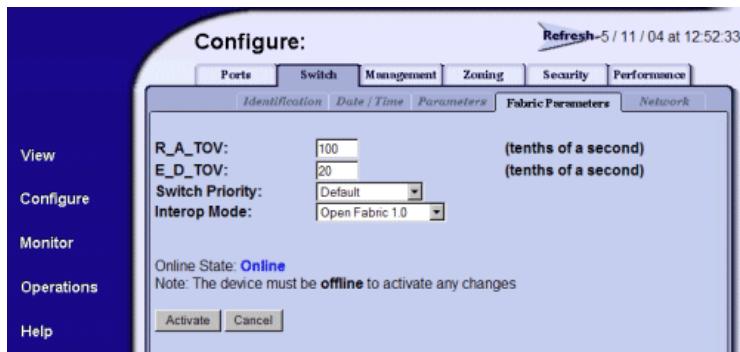
Figure 42: Switch page—Fabric parameters tab

    a.   At the **R_A_TOV field**, enter a value between 10 through 1200 tenths of a second (one through 120 seconds). The default is 10 seconds (100 tenths).

        All fabric-attached switches must be set to the same R_A_TOV. If the value is not compatible, the E_Port connection to the switch segments and the switch cannot communicate with the fabric. In addition, the R_A_TOV must be greater than the E_D_TOV.

    b.   At the **E_D_TOV** field, enter a value between 2 through 600 tenths of a second (0.2 through 60 seconds). The default is 20 tenths of a second (2 seconds).

        All fabric-attached switches must be set to the same E_D_TOV. If the value is not compatible, the E_Port connection to the switch segments and the switch cannot communicate with the fabric. In addition, the E_D_TOV must be less than the R_A_TOV.

    c.   The switch priority value designates the fabric's principal switch. The principal switch controls the allocation and distribution of domain IDs for all fabric directors and switches (including itself). At the **Switch Priority** field, select **Principal**, **Never Principal**, or **Default** (the default setting is **Default**).

      d.   Select the Interop mode:

        — McDATA Fabric 1.0. (default). Select this mode if the fabric contains only M-series switches that are operating in McDATA Fabric 1.0 mode.

        — Open Fabric 1.0. Select this mode if the fabric contains HP directors and switches, as well as other open fabric-compliant switches. Select this mode for managing heterogeneous fabrics.

5.   Click **Activate** to save the information. The message `Your changes to the operating parameters configuration have been successfully activated` displays.

6.   Set the switch online:

      a.   At the View window, select **Operations** at the left side of the panel. The **Operations** panel opens with the **Switch Beacon** page displayed.

      b.   At the **Operations** panel, click the **Online State** tab, then click **Set Online**. The message `Your operations changes have been successfully activated` displays.

Configure Network Information

Verify that the type of LAN installation with the customer's network administrator. If one switch is installed on a dedicated LAN, network information (IP address, subnet mask, and gateway address) does not require change. Go to "Configure Switch Ports" on page 98.

If multiple switches are installed, or a public LAN segment is used, network information must be changed to conform to the customer's LAN addressing scheme. Perform one of the following:

■ If network information was changed while performing "Configure Switch Network Information" on page 53, this procedure is not required. Go to "Configure SNMP Trap Message Recipients" on page 108.

■ If network information was not changed, perform the following steps to change a switch IP address, subnet mask, or gateway address:

1. Choose **Configure > Switch > Network** to display the **Network** tab (Figure 43).

Figure 43: Switch page—Network tab

    a. At the **IP Address** field, enter the new value as specified by the network administrator (default (factory preset) is *10.1.1.10*).

    b. At the **Subnet Mask** field, enter the new value as specified by the network administrator (default is *255.0.0.0*).

    c. At the **Gateway Address** field, enter the new value as specified by the network administrator (default is *0.0.0.0*).

2. Click **Activate** to save the information. The following message box displays (Figure 44).

Your changes to the Network configuration have been
successfully activated. The following Network information has
been configured to the switch:

    IP Address: 10.1.1.10
    Subnet Mask: 255.0.0.0
    Gateway Address: 0.0.0.0

In order to re-establish your browser management connection,
you must update local ARP tables on your operating system
and direct your web browser to the new IP Address displayed
above. Please consult the Installation and Service Manual
provided with this product for more information.

Figure 44: Network configuration changes activated

3. Update the address resolution protocol (ARP) table for the browser PC.

   a. Choose **File > Close** to close the EWS and browser applications. The
      Windows desktop displays.

   b. Choose **Start > Programs > Accessories > Command Prompt**. A disk
      operating system (DOS) window displays.

   c. Delete the switch's *old* IP address from the ARP table. At the command
      (C:\) prompt, enter arp -d xxx.xxx.xxx.xxx. The
      xxx.xxx.xxx.xxx is the old IP address for the switch.

   d. Click **close** (**X**) at the upper right corner of the DOS window to close the
      window or enter exit at the prompt to return to the Windows desktop.

4. At the PC, launch the browser application (Netscape Navigator or Internet
   Explorer).

5. At the browser, enter the switch's new IP address as the Internet URL. The
   Enter Network Password dialog box displays.

6. Enter the user name and password.

Note: The default user name is *Administrator* and the default password is *password*.
The user name and password are case-sensitive.

7. Click **OK**. The EWS interface opens with the View window displayed.

Configure SNMP Trap Message Recipients

Perform this procedure to configure community names, write authorizations, and network addresses and for up to six SNMP trap message recipients per Edge switch or director, or up to 12 SNMP trap message recipients per HAFM appliance. A trap recipient is a management workstation that receives notification (through SNMP) if a switch event occurs.

To configure SNMP trap recipients:

1. Choose **Configure** > **Management** to displays the **SNMP** tab (Figure 45).
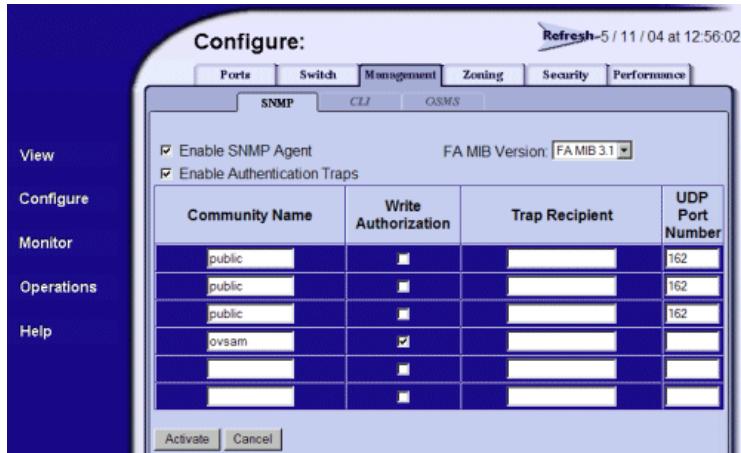
Figure 45: Management page—SNMP tab

   a. Click the **Enable Authentication Traps** check box to enable or disable transmission of SNMP trap messages to configured recipients.

   b. For each trap recipient to be configured, enter a community name of 32 or fewer alphanumeric characters in the associated **Community Name** field. The community name is incorporated in SNMP trap messages to ensure against unauthorized viewing or use.

   c. Click the check box in the **Write Authorization** column to enable or disable write authorization for the trap recipient (default is disabled). A check mark in the box indicates write authorization is enabled. When the feature is enabled, a management workstation user can change sysContact, sysName, and sysLocation SNMP variables.

d. Enter the IP address or DNS host name of the trap recipient (SNMP management workstation) in the associated **Trap Recipient** field. Use 64 or fewer alphanumeric characters. HP recommends that the IP address be used.

e. The default user datagram protocol (UDP) port number for trap recipients is 162. Enter a decimal port number in the associated **UDP Port Number** field to override the default.

2. Click **Activate** to save the information. The message "Your changes to the SNMP configuration have been successfully activated" displays.

Enable or Disable the CLI

Perform this procedure to toggle (enable or disable) the state of the switch's command line interface. To change the CLI state:

1. Choose **Configure** > **Management** > **CLI** to display the **CLI** tab (Figure 46).
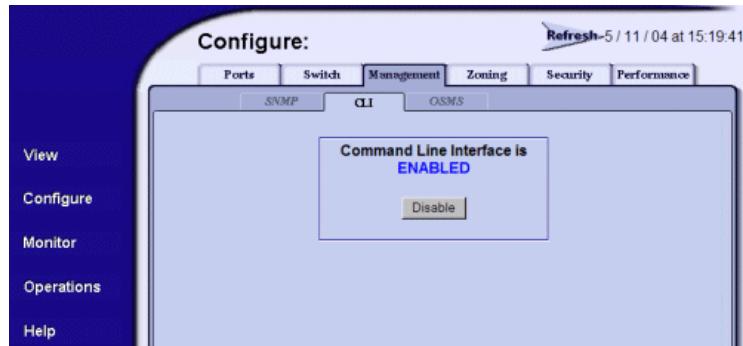
Figure 46: Management page—CLI tab

2. Perform one of the following steps as required:

   — Click **Enable** to activate the CLI. The message "`Your changes to the CLI enable state have been successfully activated`" displays.

   — Click **Disable** to deactivate the CLI. The message "`Your changes to the CLI enable state have been successfully activated`" displays.

Configure User Rights

Perform this procedure to configure the administrator-level and operator-level passwords used to access the Embedded Web Server interface through the Username and Password Required dialog box.

To configure passwords:

1. Choose **Configure > Security** to display the **User Rights** tab as shown in Figure 47.
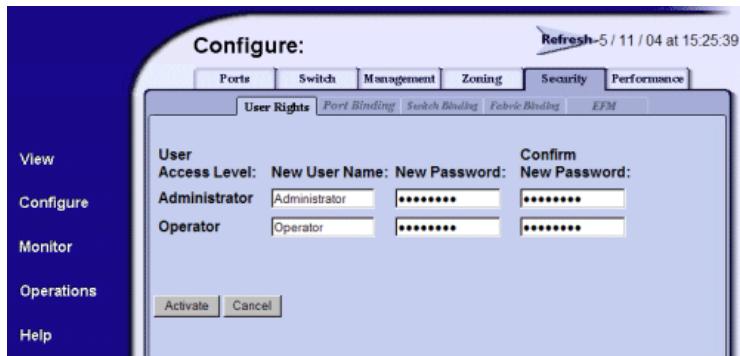
Figure 47: Security page–User Rights tab

2. For the **Administrator** set of data fields:

   a. Enter the administrator user name (as specified by the customer's network administrator) in the **New User Name** field. Use 16 or fewer alphanumeric characters.

   b. Enter the administrator password (as specified by the customer's network administrator) in the **New Password** field. Use 16 or fewer alphanumeric characters.

   c. Enter the administrator password again in the **Confirm New Password** field,

3. For the **Operator** set of data fields:

    a. Enter the operator user name (as specified by the customer's network administrator) in the **New User Name** field. Use 16 or fewer alphanumeric characters.

    b. Enter the operator password (as specified by the customer's network administrator) in the **New Password** field. Use 16 or fewer alphanumeric characters.

    c. Enter the operator password again in the **Confirm New Password** field.

4. Click **Activate** to save the information. The message "`Your changes to the user rights configuration have been successfully activated`" displays.

5. Close the browser application by choosing **File > Close**.

Manage Firmware Versions

<div style="text-align: right">**5**</div>

The Edge Switch 2/24 internal operating code is downloaded from the HAFM appliance and stored on a CTP card. Up to 32 versions can be stored on the HAFM appliance hard drive and made available for download to an Edge Switch. This chapter contains information on the following firmware management tasks:

- Determine a Switch Firmware Version, page 114
- Add a Firmware Version, page 115
- Modify a Firmware Version Description, page 118
- Delete a Firmware Version, page 119
- Download a Firmware Version to a Switch, page 120
- Back Up the Configuration, page 123

Determine a Switch Firmware Version

To determine a switch firmware version from the management appliance (Element Manager application):

1. At the management appliance, open the SAN management application.

2. At the HAFM application's physical map, right-click the product icon representing the switch to be inspected for firmware version, then select **Element Manager** from the pop-up menu. The application opens.

3. Choose **Maintenance > Firmware Library**. The Firmware Library dialog box displays (Figure 48).
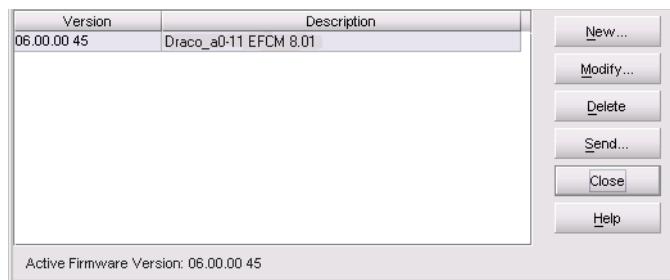
Figure 48: Firmware Library dialog box

4. The active firmware version displays at the lower left corner of the dialog box in XX.YY.ZZ format, The XX is the version level, YY is the release level, and ZZ is the patch level.

5. Click **Close**.

Add a Firmware Version

The firmware version shipped with the Edge Switch is provided on the Edge Switch 2/24 documentation CD. Subsequent firmware versions to upgrade the Edge Switch are provided to customers through the HP web site.

Note: When adding a firmware version, follow procedural information in the release notes that accompany the firmware version. This information supplements information provided in this general procedure.

---

se these steps to add an edge switch firmware version to the library stored on the HAFM appliance hard drive:

1. Obtain the new firmware version from the HP web site:

Note: The following path is subject to change.

---

     a. At the HAFM appliance or other personal computer (PC) with Internet access, open the HP web site. The uniform resource locator (URL) is http://www.hp.com/country/us/eng/support.html.

     b. Click on **Firmware Downloads** in left panel.

     c. Click the **Switch Firmware Version XX.YY.ZZ** entry. The XX.YY.ZZ is the desired version. The Windows Save As dialog box displays.

        Verify or correct the directory path specified in the **Save in** field and the file name specified in the **File name** field.

     d. Click **Save**. The new firmware version is downloaded and saved to HAFM appliance or PC hard drive.

     e. If the new firmware version was downloaded to a PC (not the HAFM appliance), transfer the firmware version file to the switch by backup disk, CD-ROM, or other electronic means.

2. At the HAFM application's physical map, right-click the product icon representing the switch for which a firmware version is to be added, then select **Element Manager** from the pop-up menu. The application opens.

3. Choose **Maintenance > Firmware Library**. The Firmware Library dialog box displays (Figure 49).

Figure 49: Firmware Library dialog box

4. Click **New**. The New Firmware Version dialog box displays (Figure 50).

Figure 50: New Firmware Version dialog box

5. Choose the desired firmware version file (downloaded in step 1) from the on HAFM appliance backup drive, CD-ROM drive, or hard drive. Verify that the correct directory path and filename display in the **File name** field and click **Save**. The New Firmware Description dialog box displays (Figure 51).

Figure 51: New Firmware Description dialog box

6. Enter a description (up to 24 characters in length) for the new firmware version and click **OK**. It is recommended the description include the installation date and text that uniquely identifies the firmware version.

7. A Transfer Complete message box displays indicating the new firmware version is stored on the HAFM appliance hard drive. Click **Close** to close the message box.

    The new firmware version and associated description display in the Switch Firmware Library dialog box.

8. Click **Close**.

9. To send the firmware version to an Edge Switch, see "Download a Firmware Version to a Switch" on page 120.

Modify a Firmware Version Description

Use these steps to modify the description of an Edge Switch firmware version in the library stored on the HAFM appliance hard drive:

1. At the HAFM appliance, open the HAFM application. The **Products View** page displays.

2. Double-click the icon representing the Edge Switch for which the firmware version description will be modified. The **Hardware View** page for the selected Edge Switch displays.

3. Choose **Maintenance > Firmware Library**. The Switch Firmware Library dialog box displays, as shown in Figure 48.

4. Choose the firmware version to be modified and click **Modify**. The **Modify Firmware Description** dialog box displays, as shown in Figure 52.
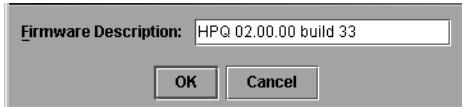
Figure 52: Modify Firmware Description dialog box

5. Enter a modified description (up to 24 characters in length) for the firmware version and click **OK**. It is recommended the description include the installation date and text that uniquely identifies the firmware version.

6. The new description for the firmware version displays in the Switch Firmware Library dialog box.

7. Click **Close**.

Delete a Firmware Version

Use these steps to delete a firmware version from the library stored on the HAFM appliance hard drive:

1. At the HAFM appliance, open the HAFM application. The **Products View** page displays.

2. Double-click the icon representing the Edge Switch from which the firmware version will be deleted. The **Hardware View** page for the selected Edge Switch displays.

3. Choose **Maintenance > Firmware Library**. The Switch Firmware Library dialog box displays, as shown in Figure 48 on page 114.

4. Choose the firmware version to be deleted and click **Delete**. A confirmation dialog box displays.

5. Click **OK**. The selected firmware version is deleted from the Switch Firmware Library dialog box.

6. Click **Close**.

Download a Firmware Version to a Switch

This procedure downloads a selected firmware version from the HAFM appliance library to an Edge Switch managed by the open instance of the Element Manager application. The procedure applies to an Edge switch with one CTP2 card, or a director with two (redundant) CTP2 cards. The process occurs concurrently without taking the Edge Switch offline or disrupting operation. The new firmware version takes effect when control is passed from the active to the backup CTP card. Although Edge Switch operation is not affected, name server, alias server, and login server functions are momentarily unavailable during CTP card switchover. Although traffic is not disrupted, the green port LEDs will flicker or blink during the IPL portion of this operation as control is passed to the other CTP card.

Note: When downloading a firmware version, follow procedural information in the release notes that accompany the firmware version. This information supplements information provided in this general procedure.

Use these steps to download a firmware version to an Edge Switch:

1. At the HAFM appliance, open the HAFM application. The **Products View** page displays.

2. Before downloading firmware version XX.YY.ZZ to an Edge Switch, Ensure that the required, compatible version of the HAFM application is running on the HAFM appliance. Refer to the release notes that shipped with HAFM.

   a. Choose **Help > About**. The About dialog box displays and lists the HAFM application version. Click **OK** to close the dialog box.

   b. If required, install the correct version of the HAFM application.

3. Double-click the icon representing the Edge Switch to which the firmware version will be downloaded. The **Hardware View** page for the selected Edge Switch displays.

4. As a precaution to preserve Edge Switch configuration information, complete the data collection procedure as follows:

   a. At the HAFM appliance, open the HAFM application. The **Products View** page displays.

   b. Double-click the icon representing the Edge Switch for which the configuration file is to be backed up. The **Hardware View** page for the selected Edge Switch displays.

   c. Choose **Maintenance > Backup & Restore Configuration**. The Backup
       and Restore Configuration dialog box displays.

   d. Click **Backup**. When the backup process finishes, the Backup Complete
       dialog box displays.

   e. Click **OK** to close the dialog box and return to the **Hardware View** page.

5. Choose **Maintenance > Firmware Library**. The Switch Firmware Library
   dialog box displays, as shown in Figure 48 on page 114.

6. Choose the firmware version to be downloaded and click **Send**. The send
   function verifies existence of certain Edge Switch conditions before the
   download process begins. If an error occurs, a message displays indicating the
   problem must be fixed before firmware is downloaded. Conditions that
   terminate the process include:

   ■ A redundant CTP card failure.

   ■ The firmware version is being installed to the Edge Switch by another
      user.

   ■ The Edge Switch-to-HAFM appliance link is down.

   If a problem occurs and a corresponding message displays, refer to the *HP
   StorageWorks Director 2/24 Service Manual* for specific information on
   isolating the problem. If no error occurs, the Send Firmware confirmation box
   displays, as shown in Figure 53.
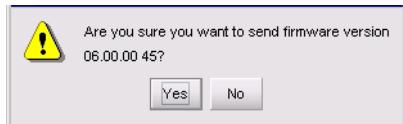
Figure 53: Send Firmware Warning dialog box

7. Click **Yes**. The Send Firmware dialog box displays.

   As the download begins, a "Writing data to FLASH" message
   displays at the top of the dialog box, followed by a Sending Files
   message. This message remains as a progress bar travels across the dialog box
   to show percent completion of the download. The bar progresses to 50% when
   the last file is transmitted to the first CTP card. The bar remains at the 50%
   point until the Edge Switch performs an Initial Program Load (IPL) (indicated
   by an IPLing message).

During the IPL, the Edge Switch-to-HAFM appliance link drops momentarily and the following events occur at the Element Manager:

■ As the network connection drops, the Edge Switch Status table turns yellow, the **Status** field displays `No Link`, and the **State** field displays a reason message.

■ The alert panel at the bottom of the navigation control panel displays a grey square, indicating Edge Switch status is unknown.

■ Illustrated FRUs in the **Hardware View** page are removed, and then displayed again as the connection is re-established.

After the IPL, a "`Synchronizing CTPs`" message displays. This message remains as files are transmitted to the second CTP card and the progress bar travels across the dialog box to 100%. When the download reaches 100%, a "`Send firmware complete`" message displays.

8. Click **Close** to close the dialog box.

9. Click **Close** again to complete the operation.

Back Up the Configuration

Use these steps to back up the configuration file on the HAFM appliance.

1. At the HAFM appliance, open the HAFM application. The **Products View** displays.

2. At the SAN management application's physical map, right-click the product icon representing the switch for which a configuration file is to be backed up, then select **Element Manager** from the pop-up menu. The application opens.

3. Choose **Maintenance > Backup & Restore Configuration**. The Backup and Restore Configuration dialog box displays (Figure 54).
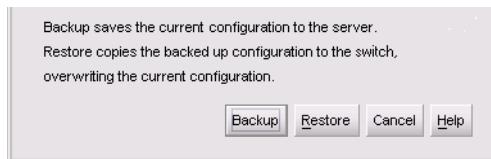
Figure 54: Backup and Restore Configuration dialog box

4. Click **Backup**. An Information dialog box displays, indicating the backup operation was initiated (Figure 55).

Figure 55: Information dialog box

5. Click **OK** to complete the backup operation and close the dialog box.

Regulatory Compliance Notices

A

This appendix covers the following topics:

Regulatory Compliance ID Numbers

For the purpose of regulatory compliance certifications and identification, your HP StorageWorks Edge Switch 2/24 is assigned a HP Regulatory Model Number. The HP Regulatory Model Number for this product is:

RSVLB-0216

The HP StorageWorks Edge Switch 2/24 Regulatory Model Number can be found on the product label, along with the required approval markings and information. When requesting certification information for this product, always refer to this Regulatory Model Number. This Regulatory Model Number should not be confused with the marketing name or product number for your HP StorageWorks Edge Switch 2/24.

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (for example, personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows the classification (A or B) of the equipment. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or ID on the label. After the class of the device is determined, refer to the corresponding statement in the sections below.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this

equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

■ Reorient or relocate the receiving antenna.

■ Increase the separation between the equipment and receiver.

■ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

■ Consult the dealer or an experienced radio or television technician for help.

Declaration of Conformity for Products Marked with FCC Logo—U.S. Only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, refer to http://www.hp.com.

For questions regarding this FCC declaration, contact:

Hewlett-Packard Company
Product Regulations Manager
3000 Hanover St.
Palo Alto, CA 94304

Or call 1-650-857-1501

To identify this product, refer to the part, Regulatory Model Number, or product number found on the product.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Network and Serial Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

IEC EMC Statement (Worldwide)

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Spécification ATI Classe A (France)

DECLARATION D'INSTALLATION ET DE MISE EN EXPLOITATION d'un matériel de traitement de l'information (ATI), classé A en fonction des niveaux de perturbations radioélectriques émis, définis dans la norme européenne EN 55022 concernant la Compatibilité Electromagnétique.

Canadian Notice (Avis Canadien)

Class A Equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (the equivalent international standards are in parenthesis):

■ EN55022 1998 (CISPR 22)–Electromagnetic Interference

■ EN55024 1998 (IEC61000–4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000–4-6, IEC61000-4-8, IEC61000-4-11)–Electromagnetic Immunity

■ EN60950 (IEC60950)–Product Safety

■ Power Quality: (IEC610000-3-2)–Harmonics and (IEC61000-3-3)-Voltage Fluctuations and Flicker

■ Also approved under UL 1950, 3rd Edition/CSA C22.2 No. 950-95, Safety of Information Technology Equipment

Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文を
お読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準
に基づくクラスB情報技術装置です。この装置は、家庭環境で使用すること
を目的としていますが、この装置がラジオやテレビジョン受信機に近接して
使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に
基づくクラスA情報技術装置です　この装置を家庭環境で使用すると電波
妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ず
るよう要求されることがあります。

Taiwanese Notice

警告使用者：這是甲類的資訊產品，在居住的
環境中使用時，可能會造成射頻干擾，在這種
情況下，使用者會被要求採取某些適當的對策。

Harmonics Conformance (Japan)

高調波ガイドライン適合品

German Noise Declaration

Schalldruckpegel Lp = 66.8 dB(A)
Am Arbeitsplatz (operator position)
Normaler Betrieb (normal operation)
Nach ISO 7779:1988 / EN 27779:1991 (Typprüfung)

Laser Safety

⚠ **WARNING:** To reduce the risk of exposure to hazardous radiation:

■ Do not try to open the laser device enclosure. There are no user-serviceable components inside.

■ Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.

■ Allow only HP authorized service technicians to repair the laser device.

Laser Safety (Finland)

LASERTURVALLISUUS

LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

Fibre Channel -kytkinlaitteessa on 16 optista liitäntäporttia, joissa on laserdiodin sisältävä lähetinosa. Fibre

Channel -kytkinlaite on käyttäjälle turvallinen luokan 1 laserlaite, eikä käyttäjä voi altistua turvallisuusluokan 1 ylittävälle lasersäteilylle toimiessaan käyttöohjeen mukaisesti.

Laitteen turvallisuusluokka on määritetty standardin EN 60825-1 (1994) mukaisesti.

VAROITUS !

Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

VARNING !

Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

Fibre Channel -kytkinlaitteessa ei ole käyttäjän tehtäväksi tarkoitettuja huolto- tai säätötoimenpiteitä. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö.

Tiedot laitteessa käytettävän laserdiodin säteilyominaisuuksista:

Aallonpituus 850 nm

Certification and Classification Information

This product contains a laser internal to the Optical Link Module (OLM) for connection to the Fibre Channel communications port.

In the USA, the OLM is certified as a Class 1 laser product conforming to the requirements contained in the Department of Health and Human Services (DHHS) regulation 21 CFR, Subchapter J. The certification is indicated by a label on the plastic OLM housing.

Outside the USA, the OLM is certified as a Class 1 laser product conforming to the requirements contained in IEC 825-1:1993 and EN 60825-1:1994, including Amendment 11:1996.

The OLM includes the following certifications:

- UL Recognized Component (USA)
- CSA Certified Component (Canada)
- TUV Certified Component (European Union)
- CB Certificate (Worldwide)

The following figure shows the Class 1 information label that appears on the plastic cover of the OLM housing.

```
CLASS 1
LASER PRODUCT

LASER KLASSE 1
```
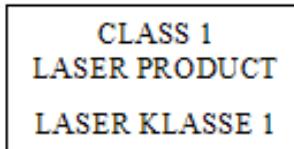
Declaration of Conformity

The Declaration of Conformity is shown on the next page. TBD: REPLACE?

hp

invent

DECLARATION OF CONFORMITY
According to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name:	Hewlett-Packard Company
Manufacturer's Address:	11311 Chinden Blvd. Boise, ID 83714 USA

Declares, that the product

Product Name:	hp StorageWorks edge switch 2/24
Product Number:	316095-B21, DS-DMGGE-BD, and ES-4500
Regulatory Model Number:	RSVLB-0216
Product Options:	All

Conforms to the following Product Specifications:

Safety:	IEC 60950:1991+A1+A2+A3+A4 / EN 60950:1992+A1+A2+A3+A4+A11 GB 4943:1995 IEC 60825-1:1993 / EN 60825-1:1994 +A11, Class 1 (Laser/LED)
EMC:	CISPR 22:1997+A1 / EN 55022:1998 +A1 Class A [1] GB 9254:1988 CISPR 24:1997 / EN 55024:1998 IEC 61000-3-2:1995 / EN 61000-3-2:1995 + A14 IEC 61000-3-3:1994 / EN 61000-3-3:1995

Supplementary Information:
The product herewith complies with the requirements of the Low Voltage Directive
73/23/EEC and the EMC Directive 89/336/EEC and carries the CE-marking accordingly.

1) The Product was tested in a worst-case configuration which maximizes RFI
emissions.

Boise, ID USA
November 18, 2002

George E. Barrett, Regulatory Mgr.

European contact for regulatory topics only: Hewlett-Packard GmbH, HQ-TRE, Herrenberger Strasse 140, D-71034 Böblingen (FAX: + 49-7031-14-3143)

Technical Specifications

B

This appendix contains the following information:

- Factory Defaults, page 138
- Physical Dimensions, page 140
- Environmental Specifications, page 141
- Power Requirements, page 142
- Operating Tolerances, page 143
- Laser Information, page 144

Factory Defaults

Table 4 lists the defaults for the passwords and IP, subnet, and gateway addresses.

Table 4: Factory-Set Defaults

Item	Default
User name	Administrator
Customer password	password
Maintenance password	level-2
IP address	10.1.1.10
Subnet mask	255.0.0.0
Gateway address	0.0.0.0

Table 5 provides the Edge Switch factor default values for Reset Configuration option.

Table 5: Switch Factory-Default Values for Reset Configuration Option

Configuration	Description	Default
Identification	Switch Name	NULL string
	Switch Description	"Fibre Channel Switch"
	Switch Contact	"End User Contact (please configure)"
	Switch Location	"End User Contact (please configure)"
Ports	Port Names	NULL strings
	Port Blocked States	Unblocked
	FAN	Enabled
	LIN Alerts	Enabled
	Ports enabled	8
Switch Addressing	IP Address	10.1.1.10
	Subnet Mask	255.0.0.0
	Gateway Address	0.0.0.0
	MAC Address	PROM value

Table 5: Switch Factory-Default Values for Reset Configuration Option (Continued)

Configuration	Description	Default
Operating Mode	Must select one of two modes: McData 1.0 or Open Fabric 1.0. The recommended mode is Open Fabric 1.0.	Open Fabric 1.0 mode
Operating Parameters	Preferred Domain ID	1
	R_A_TOV	10 seconds (100 tenths)
	E_D_TOV	2 seconds (20 tenths)
	Switch Priority	Default
	Switch Speed	2 Gb/sec
	Rerouting Delay	Enabled
SNMP	SNMP Communities	"public" — 5 NULL strings
	SNMP Write Authorizations	Read only per community
	Trap Recipient IP Addressees	0 for each
	UDP Port	162
	SNMP Authorization Trap State	disabled
Management appliance	Active Equal Saved State	Disabled
	Remote Offline Control State	Disabled
Zoning	Number of Zone Members	0
	Number of Zones	0
	Number of Zone Sets	0
	Zone Names	None
	Zone Sets Names	None
	Zone Members	None
	Default Zone State	Disabled
	Active Zone Set State	Disabled
	Active Zone Set Name	NULL string

Physical Dimensions

Table 6 lists Edge Switch 2/24 dimensions.

Table 6: Dimensions

Dimension	Size
Height	4.3 cm (1.7 in)
Width	43.4 cm (17.1 in)
Depth	48.3 cm (19.0 in)
Weight	7.7 kg (17 lb)
Shipping Weight	18.1 kg (40 lb)

Environmental Specifications

lists environmental ranges for shipping, storing, and operating the HP StorageWorks Edge Switch 2/24.

Table 7: Environmental Specifications

Specification	Shipping	Storage	Operating
Weight	18.1 kg (40 lb)	7.7 kg (17 lb)	7.7 kg (17 lb)
Temperature	-40° F to 140° F (-40° C to 60° C)	34° F to 140° F (1° C to 60° C)	40°F to 104°F (4°C to 40 °C)
Humidity	5% to 100%	5% to 80%	8% to 80%
Maximum wet-bulb temperature	84° F (29° C)	84°F (29°C)	81°F (27°C)
Altitude	40,000 ft (12,192 m)	40,000 ft (12,192 m)	10,000 ft (3,048 m)

Power Requirements

Table 8 lists Edge Switch 2/24 power requirements.

Table 8: Power Requirements

Specification	Value
Input voltage	90 to 264 VAC
Input frequency	47 to 63 Hz

Operating Tolerances

Table 9 lists heating and cooling specifications, shock tolerances, vibration, acoustical noise, and inclination.

Table 9: Operating Tolerances

Specification	Value
Heat dissipation	49 watts (167 BTU/hr)
Cooling airflow clearances	Right and left sides: 1.3 cm (0.5 inches)
	Front and rear: 7.6 cm (3.0 in)
	Top and bottom: No clearance required
Shock and vibration tolerance	60 Gs for 10 milliseconds without nonrecoverable errors
Acoustical noise	70 dB "A" scale
Inclination	10° maximum

Laser Information

Three configurations of cards with fixed optics will be provided for each of the connector types: four extended long-wave ports, four long-wave ports, and four short-wave ports.

Table 10: Laser Specifications–2 Gb

Part Number	Transceivers on UPM Card	Wave Length	Media/ Distance	Standard
300836-B21 Long wave: 35 Km	4 Extended Long wave	1310 nm	9/125 µm Single-mode: 1 m–35 Km	100-SM-LL-L
300835-B21 Long wave: 10 Km	4 Long wave	1310 nm	9/125 µm Single-mode: 1 m–10 Km	100-SM-LL-L
300834-B21 Short wave	4 Short wave	850 nm	50/125 µm Multimode: 2 m–500 m 62.5/125 µm Multimode: 1 m–200 m	100-M5-SN-I

Edge Switch 2/24 Installation Guide